FEBRUARY 12, 1951

STEEL

The Weekly Magazine of Metalworking

55,000 Subcontract Supply Opportunities

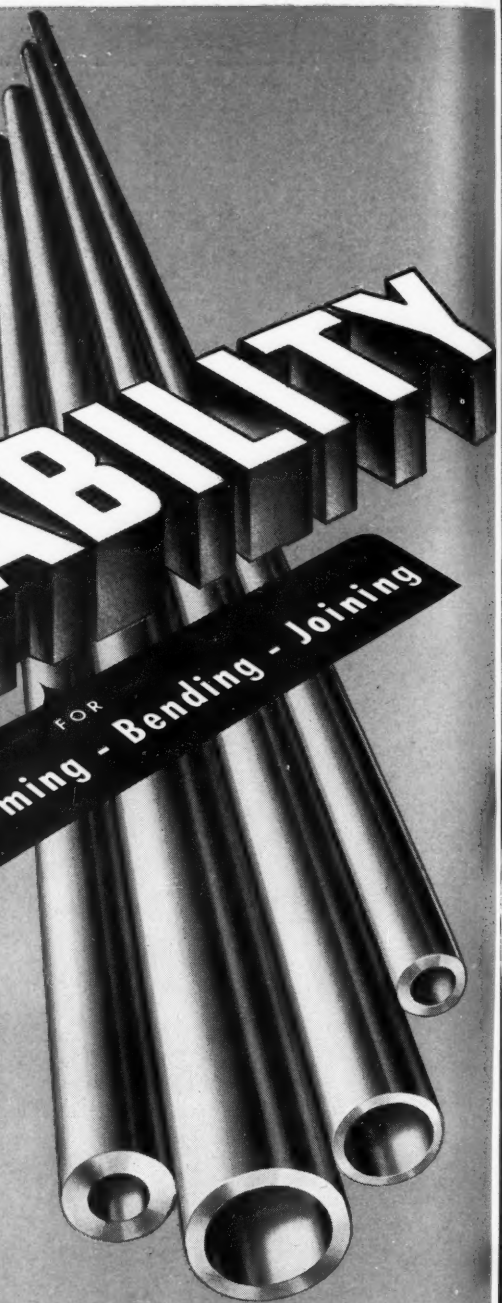
IN THE AIRCRAFT PROGRAM —see page 43

CMP—Guide for Output, Guarantee for Priorities —page 45

Another cost-saving advantage for users of

B&W
MECHANICAL
TUBING

TAILOR-MADE
WORKABILITY
FOR
Machining - Forming - Bending - Joining



You have a wide choice of

B&W MECHANICAL TUBING

TYPES—Seamless (hot finished, cold drawn or rocked). Welded (from hot or cold rolled strip).

GRADES—Carbon, Alloy, and Stainless Steels.

SIZES—Up to 9⅝" O.D. in full range of wall thicknesses.

QUALITY—Open-hearth and electric furnace steels, including aircraft and magnaflux qualities.

CONDITION—Unannealed, annealed, tempered, normalized, or otherwise heat-treated as required.

SURFACE FINISHES—As rolled, as drawn, as welded, flash removed, turned, scale-free, and polished.

SHAPES—Round, square, rectangular, oval, streamlined, and special shapes.

FABRICATION—Upsetting, expanding, bending, safe-ending, and machining.

B&W
SEAMLESS and WELDED
TUBES

TA-1509

THE BABCOCK & WILCOX TUBE COMPANY • *General Offices:* Beaver Falls, Pa. • *Plants:* Alliance, Ohio and Beaver Falls, Pa.

WIRE *that does one job well*

Rows of these elements, stretched and anchored within the frames of automobile seats and furniture, provide a foundation of resilient steel for comfortable seating.

Leading makers of the zig-zag type of springs depend on our MB high-carbon wire for the right degree of tensile strength, ductility, and toughness. The proper temper of MB wire is governed by the type of upholstery construction in each case. This application is but one of countless examples of Bethlehem's ability to produce steel wire in special grades — each of which does one job well.

Bethlehem has pioneered in many kinds of wire for specific uses. Each grade has certain characteristics which lead to good performance and low costs.

Right now is a good time to bring your wire problems to us. Whether you're trying to trim down costs or improve the quality of your products, you can depend on Bethlehem wire.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

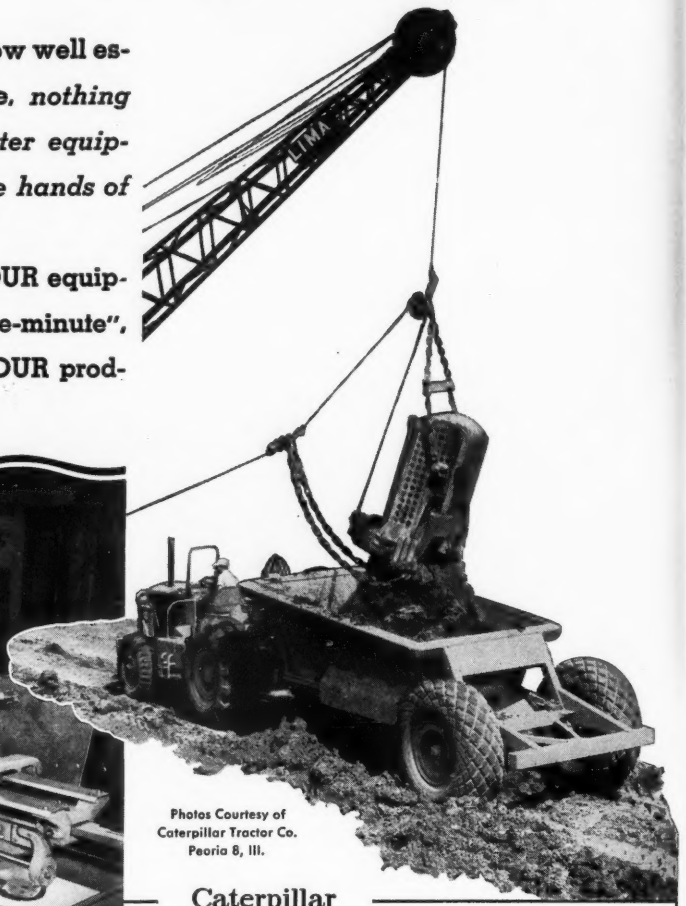
BETHLEHEM WIRE

BETHLEHEM STEEL

Your keenest competitor knows

That no matter how well established his business may be, *nothing can damage it more than better equipment and better methods in the hands of an aggressive rival!*

He also knows that unless YOUR equipment and methods are "up-to-the-minute", YOU cannot continue to sell YOUR products at competitive prices.



Photos Courtesy of Caterpillar Tractor Co. Peoria 8, Ill.

Caterpillar
REG. U.S. PAT. OFF.

Here's a big manufacturer, builder of big machines, who knows the competitive advantages of Jones & Lamson Turret Lathes! CATERPILLAR TRACTOR CO. —world famous producer of Diesel Engines, Tractors, Motor Graders and Earth-moving Equipment—makes sure of top-flight production economy by concentrating on up-to-the-minute machines and methods.

Meeting production schedules on Caterpillar's turret lathe jobs, like the husky malleable iron Adjustable Bearing shown here, calls for the last word in turning equipment. To bore, turn, face and chamfer such parts, at peak efficiency, takes a fast, heavy-duty turret lathe with reserves of *Speed, Power, Rigidity and Repetitive Accuracy. It takes a J & L!*

Are YOU equipped to YOUR best advantage? Get a free check-up on your present operations. Write today to Jones & Lamson's PRODUCTION RESEARCH DEPARTMENT for this service.

Turret Lathes—Fay Automatic Lathes—Thread Grinders—Optical Comparators—Threading Dies

JONES & LAMSON
MACHINE COMPANY
Springfield, Vermont, U.S.A.

What's good for the complexion of tin?

...*a brush!* Here's how to make tin plate keep its "steel mill complexion":

To produce and preserve high-quality finish of tin sheets calls for thorough cleaning prior to plating. Otherwise surface imperfections result during plating and costly work must be scrapped.

To clean the sheet, all traces of foreign matter are removed automatically at 1500 feet per minute with Osborn power brushing. Although operating under hot, high-pressure sprays, the Osborn brushes operate around-the-clock, assuring uninterrupted production and highest quality.

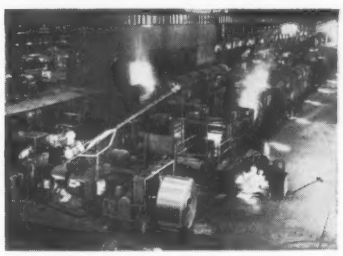
Find out how Osborn's improved brushing techniques can help *you* on product finishing and cleaning problems. A survey by your **O**sborn **B**rushing **A**nalyst will demonstrate what power brushing can do. Simply write for an **OBA.** *The Osborn Manufacturing Company, Dept. 418, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

OSBORN

LOOK FOR THE NAME OSBORN . . . RECOGNIZED EVERYWHERE FOR QUALITY WORKMANSHIP AND MATERIALS

Cleans strip continuously at 1500 feet per minute with Osborn Power Brushing

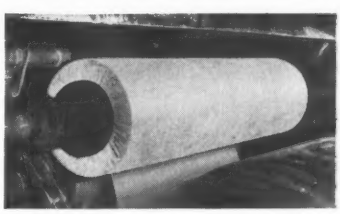
OSBORN power brushing is being used widely by industry on many diversified applications of cleaning or finishing metallic and non-metallic parts. On the work shown below, Osborn power brushing mechanically cleans strip steel prior to electrolytic tin plating.



Continuous sheet scrubbing line at a leading rolling mill.

The continuous sheet scrubbing line in this rolling mill is a vital link in its over-all operation. Any interruptions become extremely costly since they tie up other lines, disrupt production schedules and lose precious man-hours.

Thorough cleaning of the sheet steel prior to tin plating is an absolute necessity. The slightest trace of rolling oil or dirt causes surface blemishes and porosity in the tin coating.



One of six Osborn Heli-Master Brushes used with hot, high-pressure spray.

For continuous, dependable performance at this mill, six Osborn Heli-Master* Brushes perform their mechanical scrubbing job efficiently, day in and day out, and at low end-of-service cost.

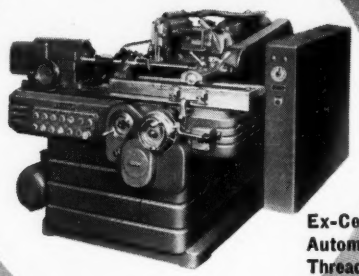
To insure maximum production efficiency on your continuous strip cleaning, sheet scrubbing, scale removing, conveyor cleaning and product-finishing operations, consult your **O**sborn **B**rushing **A**nalyst. There's no obligation.

*Trademark

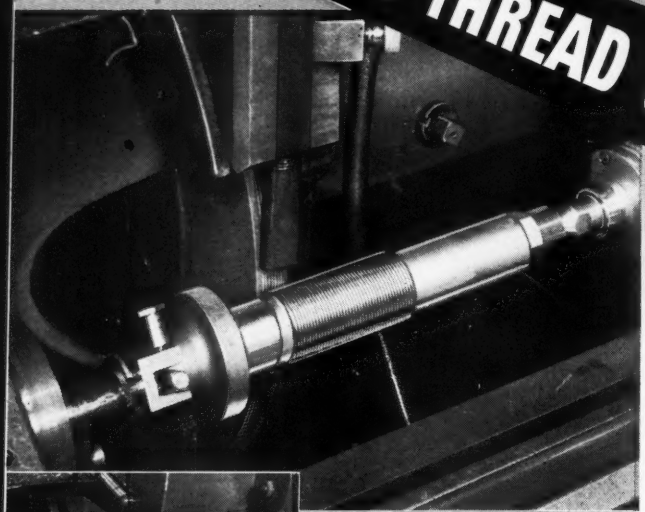
THE BUSIEST MACHINE IN YOUR SHOP

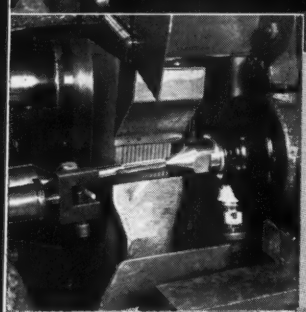
EX-CELL-O

AUTOMATIC THREAD GRINDER

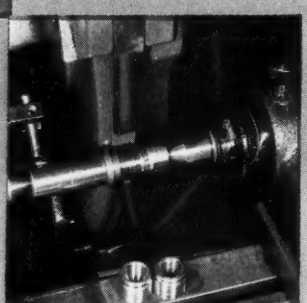


Ex-Cell-O Style 33 Automatic Precision Thread Grinder for external threads. Standard models for internal threads and universal models for both internal and external threads also are made by Ex-Cell-O.



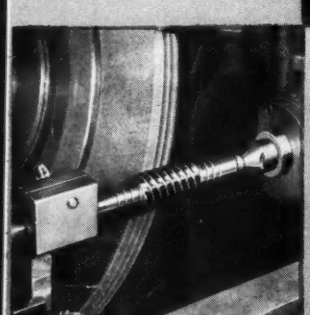


Grinding threads on cast-iron part with diamond dressed multiple-rib wheel on a Style No. 33 Grinder.



Skip-tooth diamond dressed multiple-rib wheel (wheel form is twice pitch of thread) grinding a 5/16"—18 tap.

Threading stainless steel aircraft bushings on an Ex-Cell-O Style 33 Automatic Thread Grinder.



All three starts of a triple-start worm are ground simultaneously with a triple-rib wheel.

For high production with extraordinary precision, Ex-Cell-O Style 33 Automatic Thread Grinder is a popular choice. It is easy to set up and operate. With equipment for using multi-rib wheels, as shown in the accompanying photographs, output exceeds other methods.

Thread grinding is a must for hardened steel parts. More and more shop supervisors are discovering that grinding is also economical for materials that are tough and abrasive, or soft materials that are inclined to tear under the pressure of cutting tools.

For more information on thread grinding call your Ex-Cell-O representative or write directly to Ex-Cell-O. Please state whether you are interested in internal or external threads or both.

XLO

EX-CELL-O CORPORATION DETROIT 3 MICHIGAN

51-13

MANUFACTURERS OF PRECISION MACHINE TOOLS CUTTING TOOLS • RAILROAD PINS AND BUSHINGS DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

STEEL
The Weekly Magazine of Metalworking

VOL. 128 NO. 7 FEBRUARY 12, 1951

THIS WEEK IN METALWORKING

NEWS

Behind the Scenes ... 6
Letters to the Editors ... 12
The Metalworking Outlook ... 35
As the Editor Views the News ... 39
50,000 Airplanes—Opportunity for Subcontractors ... 43
Checklist on Controls ... 49
Windows of Washington ... 50
Mirrors of Motordom ... 57
The Business Trend ... 61
Men of Industry ... 65
Obituaries ... 69

PRODUCTION-ENGINEERING

Production and Engineering News at a Glance ... 71
Mass Marquenching Speeds Gear Output ... 72
Straight-Flow Materials Handling Simplifies Integrated Operation ... 75
Electroforming—A Mass-Production Tool ... 77
Carbon Block Proposed for Open-Hearth Bottoms ... 82
Movies Record Blast Furnace Combustion Turbulence ... 87
Calendar of Meetings ... 104
New Products and Equipment ... 107
Helpful Literature ... 115

MARKETS

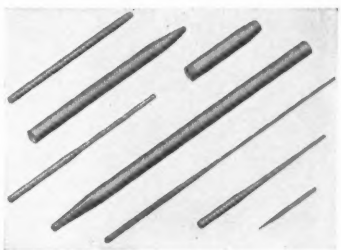
The Market Outlook ... 117
Metal Prices and Composites ... 118
Nonferrous Metals ... 124
Metalworking Briefs ... 143

Editorial and Business Staff—Page 10. Advertising Index—Page 148. Editorial index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.

***Next Week*... Training Manpower for Defense Jobs... Continuous Electroplating Effects Operational Economy... How to Set Up a Successful Equipment Replacement Program... Good Fixtures a Must for Interchangeable Machined Parts**

Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $18. Single copies (current issues) 35 cents. Metalworking Yearbook issue $2.00. Entered as second class matter at the postoffice in Cleveland, under the Act of March 3, 1879. Copyright 1951 by Penton Publishing Co.

YOU SAVE
on parts
made to
your specifications
by
TORRINGTON



You save time and money when you rely on our high productive capacity and special equipment to turn out precision parts to your order.

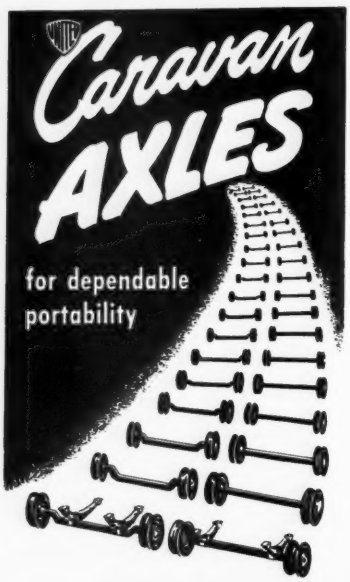
Typical are surgical and dental instruments, pen and pencil barrels, soldering iron cases, etc. Medium wall tubing up to 2½" O.D. and solid steel .015" to ⅝" diameter handled.

We are also set up to make such parts as special rollers, shafts, studs, dowel pins, special needles, instrument shafts and pivots, screw driver and ice pick blades, knurled mandrels and spindles, etc.

Send your prints and specifications today for prompt quotation.

THE TORRINGTON COMPANY
Specialty Department
556 Field Street • Torrington, Conn.

Makers of
TORRINGTON NEEDLE BEARINGS



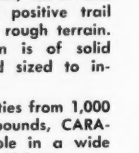
YOU'LL ALWAYS ROLL WITH "CARAVAN"

CARAVAN units increase operating efficiency, reduce axle costs, and provide dependable movability for all types of portable equipment. These durable axles are recommended for military and industrial as well as field-service and construction equipment such as concrete mixers, welding apparatus, drilling rigs, etc.

Available in two-wheel, single-axle units as well as four-wheel automotive type running-gear, CARAVAN units are furnished in straight and drop types. CARAVAN four-wheel axles employ controlled camber, toe-in and caster, which facilitate positive trail at high speeds or over rough terrain. Axle beam construction is of solid square steel stock, and sized to individual specifications.

Featuring load capacities from 1,000 to more than 12,000 pounds, CARAVAN axles are available in a wide range of sizes and models to meet all requirements.

Multicolored, 12-page, illustrated Catalog No. 101 describes complete line of CARAVAN axles as well as CARAVAN surge-control braking device and CARAVAN retractable third-wheel for use on two-wheel, single-axle units. Catalog includes photographs, line drawings and complete specifications. Write today for your copy.



THE UNITED MFG. COMPANY

214 W. INTERSTATE ST. • BEDFORD, OHIO

Behind the Scenes...

Polinidal Sinus

Cartoonist Pat Dwyer Jr., who is also our poet laureate, wrote these lines while standing up during an enforced vacation in the hospital:

Gather 'round ye minstrels . . . aye,
gather 'round and wail,
And listen while I tell you this tender,
trembling tale.
I use the term advisedly; my tail is
tender, true:
Macabre in their humor, they even
stained it blue.
"Behold," the doctors chorused, "the
lump, it should be minus!
"A doleful cyst is what it is: A Polinidal Sinus!"

Space limitations and the postal regulations force us to skip the graphic description of the operation. Our poet ends his epic on a note of supplication:

Beneath the pads, beneath the wads,
the raging wound is healing;
Through my buttocks and my back I
sense a surge of feeling.
"Dear Lord," we cry, "if once again
You feel You must confine us,
"Do as Thou wilt, of course, but
please . . . no Polinidal Sinus!"

Authority

Geraldine, a cleaning woman in our building, our night editor and an avid reader of the industrial press, reports that STEEL's Chicago Editor Erle Ross has made *The Chicago Purchaser* with a four-page article on steel procurement.

Erle's article appears in the January, 1951, issue of that publication put out by the Purchasing Agents Association of Chicago. He outlines the steel buying problems in that area just as he does every week for you.

Little Shavers

Miscellaneous intelligence: 30 per cent of men under 20 who shave use electric razors. In 1940, 43 million men 15 years and older made up the shaving population. In 1950 the shavers increased to 54 million. About 1.5 million men become of "shaving age" each year.

Deductions

One of STEEL's newest subscribers is Oak Ridge Institute of Nuclear Studies. The group signed up for only one year. We're trying to deduce what that means: Does Oak Ridge expect that the crisis will be over in a year or that we'll be blown to smithereens in a year?

Another new subscriber sent us a check for $10.40 although the yearly rate is $10. He's probably taking into account a 4 per cent inflation since last summer.

Versatile

Good advice, education, entertainment—ads in STEEL give you that trio each week. American Optical Co., on page 133, advises how to avoid eye injury. We learned how Christendom was saved by steel from Youngstown Sheet & Tube Co. on page 23. We got a belt, as we do every time one appears, out of Hanlon-Gregory Galvanizing Co.'s cartoon on page 106.

Puzzle Corner

In the problem of Jan. 29 about the broken rock, the weights of the pieces are 1, 3, 9 and 27 pounds. First in with the correct answer was T. S. Bean of Barber & Ross Co.

Jack Doxsey of Hill & Knowlton of Cleveland submits this puzzle:

In Rifle Row live five officers. They are a brigadier, a colonel, a major, a captain, and a lieutenant. Their names, not necessarily respectively, are Grenade, Howitzer, Mustardgas, Verylight, and Tank.

Each officer has one and only one sister and each is married to a sister of one of the other officers.

The following particulars are available:

1. One at least of the brothers-in-law of Mustardgas is superior in rank to Mustardgas.
2. The Captain did not serve at Gallipoli.
3. Both brothers-in-law of Howitzer served in France, as have both brothers-in-law of Tank, but neither brother-in-law of the Brigadier.
4. Tank has served in Palestine as have both his brothers-in-law, and the Lieutenant has not.
5. The Colonel has served in China as have both his brothers-in-law.
6. Tank has served in China, as has only one of his brothers-in-law. The Brigadier has not served in China, but has served with both his brothers-in-law at Gallipoli.
7. Verylight has not served either in Gallipoli or in Palestine.

What is the name and rank of each of the five officers?

Shrdlu

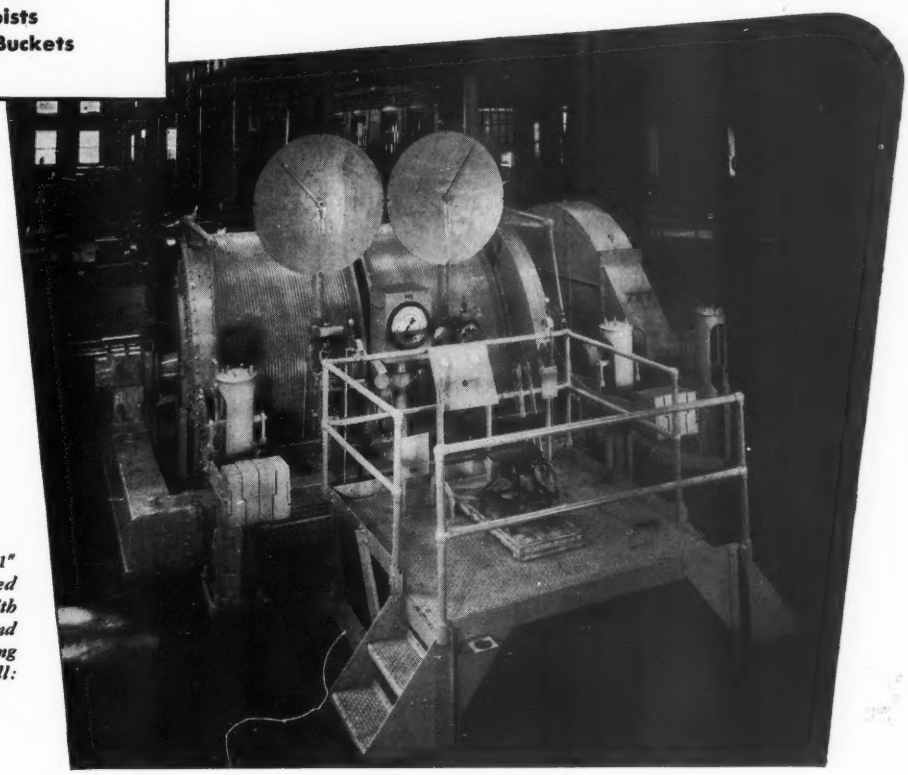
Metalworking Outlook—Page 35

Wellman will build it

- Special Cranes
- Mine Hoists
- Car Dumpers
- Gas Producer Plants
- Ore Bridges
- Charging Machines
- Industrial Furnaces
- Gas Flue Systems
- Gas Reversing Valves
- Coke Pushers
- Skip Hoists
- Clamshell Buckets

Wellman Electric Mine Hoists

Proved by performance



Wellman 10' x 4' 11" Double Drum Geared Electric Mine Hoist with 7' axial plate clutch and 10' x 13' Parallel Acting Brakes. Rated rope pull: 22,000 lbs.

● For more than half a century, in mines all over the world, Wellman Electric Mine Hoists have been used because they combine expert design with expert construction . . . featuring all the "modern improvements" developed in our 50 years' experience. Wellman Mine Hoists provide maximum safety, peak economy, and trouble-free operation under a wide variety of conditions. Let us give you recommendations for hoists that will do your job most satisfactorily.

THE WELLMAN ENGINEERING COMPANY

7029 CENTRAL AVENUE • CLEVELAND 4, OHIO

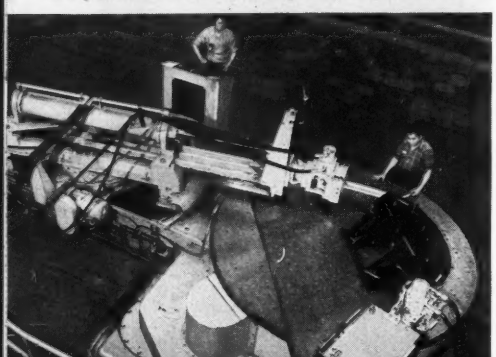
BATH the machine tha fo

SHEETS, EXTRUSIONS, TUBING RO

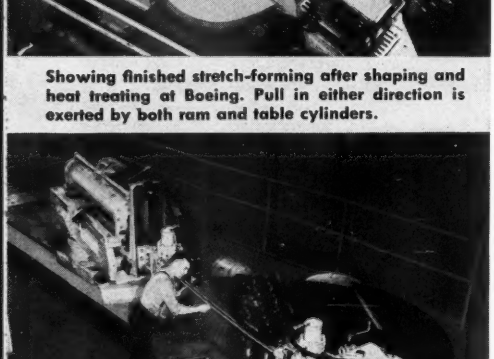
The BATH machine provides the 14 ess tials of a UNIVERSAL Contour Former is the only machine that can form virtu ly all the shapes that will be required future aircraft design.

Hundreds of shapes, with compou curves and varying radii in many plan are being formed on BATH exclusiv because no other machine can prod them. Read the 14 essentials listed bel and you will choose BATH—for o BATH provides them all.

Above: Stretch-forming and twisting around a compound curve in a multiplicity of planes.



Showing finished stretch-forming after shaping and heat treating at Boeing. Pull in either direction is exerted by both ram and table cylinders.

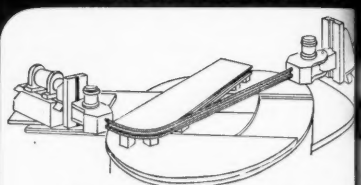


Illustrating the tangent stretching principle on a light section at Boeing. Same machine will handle from 1,000-lb. to 100,000-lb. pull.

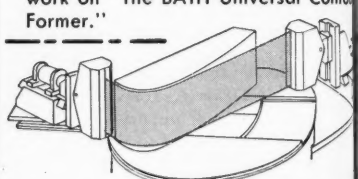
Aluminum gun turret rings accurately formed to complete circle.

Large corrugated aluminum sheets accurately formed on the BATH machine.

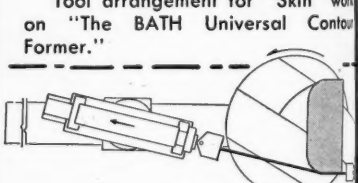
TYPICAL DIE SET-UPS



Tool arrangement for "Extrusion work on "The BATH Universal Contou Former."



Tool arrangement for "Skin" wor on "The BATH Universal Contou Former."



Typical die set-up for stretch forming.

Typical compression forming set-up.

nly B

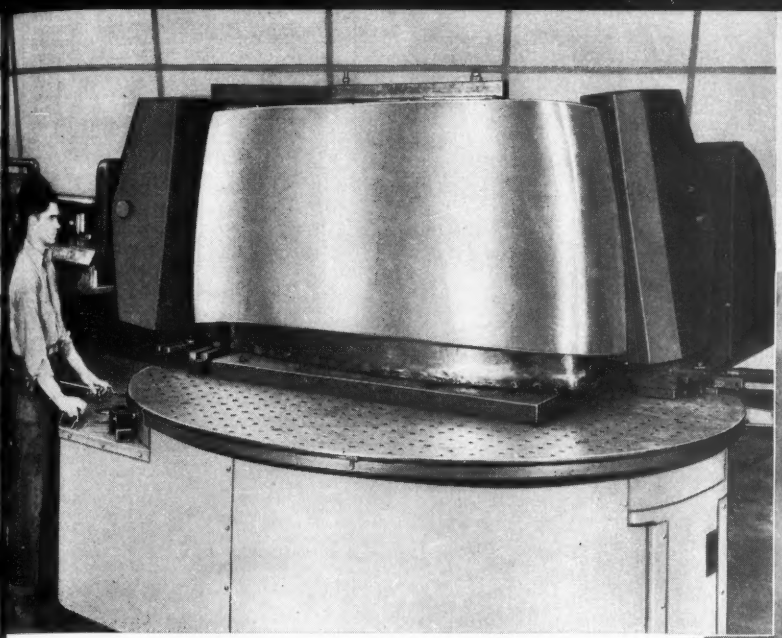
1. Stretch cylinde suited t
2. Either member
3. Tange mits sm
4. Heavy roll for
5. Full cir
6. Long p setting
7. Design on mat
8. Concen permits
9. Fast Se roll ass
10. Forms vertical
11. Materi and ve
12. Safety: to an a points.
13. Built t deflecti
14. Faster

THE CYRIL BAT CO

6972 MACHINERY AVEN

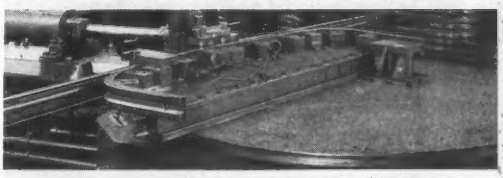
forms ALL the shapes

ROLLED AND FORMED SHAPES

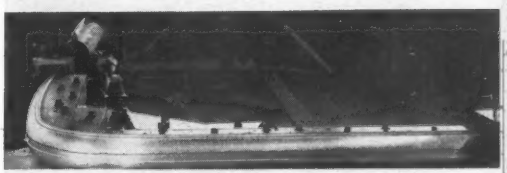


Left: Photo illustrates how typical outer-skin section is stretch-formed on the BATH Contour Former. Rotating table construction permits forming sheets with most any combination of curves.

Showing aluminum "Z" extrusion being formed in both horizontal and vertical curves.



Above: Illustrates compress forming of heavy corrugated and flanged section.



Showing progressive stretch-forming of a 20-foot aluminum extrusion.

Showing how full circles and spirals are formed on the BATH machine.

Only BATH Provides ALL These Features

1. **Stretch and compress forming on one machine.** Two-way acting cylinders and reversible table allows choice of forming method best suited to part.
2. **Either sheets or extrusions are formed on the same machine.** Jaw members are movable and adaptable to any cross section.
3. **Tangential, progressive, line by line, forming** on a rotating table permits small capacity machine to do the work of a heavier one.
4. **Heavy sections and parts** that cannot be stretched, may be wipe or roll formed.
5. **Full circles or spirals** are formed in one setting for most any alloy.
6. **Long parts up to 25 feet or more,** can be stretch-formed without re-setting jaws or dies.
7. **Designed to stretch-form reverse bends** without releasing tension on material.
8. **Concentrated application of full tonnage** over small area at a time permits angularity change on extrusions while contours are being formed.
9. **Fast Set-Up:** Die is mounted on table, and stretch heads, wiper shoe or roll assembly, can then be easily adjusted to height desired.
10. **Forms or Rolls in Two Planes:** Produces parts with both horizontal and vertical curves simultaneously.
11. **Material can be twisted while being formed** in varying horizontal and vertical planes.
12. **Safety:** Over 10 years of operation have resulted in no known accident to an operator. Machine damage is prevented by shear pins at critical points.
13. **Built to Machine Tool Standards:** Deep sections, eliminating machine deflection, assures constant precise part duplication.
14. **Faster production per hour** with very low scrap loss, rarely running 1%.

COMPANY

CLEVELAND 3, OHIO

WELD

COMPLETE, DEPENDABLE Electrode Service

for Welding

STAINLESS STEELS

•

HIGH TENSILE LOW ALLOY STEELS

•

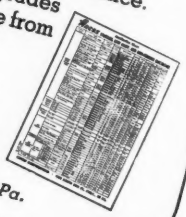
NON-FERROUS METALS

Only ARCOS makes a complete line of *regularly available* electrodes in stainless, low hydrogen and non-ferrous types. From them you can select the proper grade for welding straight chrome, chrome-nickel and chrome-moly steels; low alloy, high tensiles; nickel, copper-nickel and other copper or copper-base alloys.

You can depend on ARCOS electrodes for uniformity in results from pound after pound. Specialized quality control is responsible for consistently high performance. All standard grades and sizes available from distributor stocks.

SEND FOR THIS APPLICATION CHART showing types available, popular names, applications, specifications, types of coatings and color identification.

ARCOS CORPORATION
1500 South 50th St., Philadelphia 43, Pa.



WITH ARCOS

Specialists in Stainless, Low Alloy and Non-Ferrous Electrodes

STEEL

EDITORIAL STAFF

Editor-in-Chief ..... E. L. SHANER
Editor ..... IRWIN H. SUCH
Managing Editor ..... WALTER J. CAMPBELL
Market Editor ..... WM. M. ROONEY
Engineering Editor ..... WALTER TOERGE
Steel Plant Editor ..... J. D. KNOX
Machine Tool Editor ..... GUY HUBBARD
Consulting Editor ..... ALLEN G. GRAY
Art Editor ..... DON S. CADOT

Associate Editors:

A. H. ALLEN
VANCE BELL, FRANK R. BRIGGS
DAN REEBEL, JOHN S. MORGAN

Assistant Editors:

HENRY J. HOLTZ, DOLORES K. MAILLE
EDWIN L. KARPICK, L. J. SKUDERIN
EDWARD C. BIRKNER, M. T. BORGERHOFF
WILLIAM R. WOLFE

Resident Editors:

Washington ..... E. C. KREUTZBERG
New York ... B. K. PRICE, L. E. BROWNE
Pittsburgh ..... J. C. SULLIVAN
Detroit ..... H. C. TUTTLE
Chicago ..... E. F. ROSS
London, European Editor, VINCENT DELPORT

Editorial Correspondents:

Birmingham ..... R. W. KINCEY
Buffalo ..... L. C. FELDMANN
Cincinnati ..... SAMUEL S. CARR
St. Louis ..... MAC L. HUTCHENS
Youngstown ..... GEORGE R. REISS
Los Angeles ..... NORMAN LYNN
San Francisco ..... EDWARD HAVERTY
Seattle ..... R. C. HILL
Dallas ..... C. K. CATES
Toronto ..... F. S. TOBIN
Birmingham, Eng. ..... J. A. HORTON
Paris, France ..... LEON JAUDOIN
Liege, Belgium ..... JACQUES FOULON
Dusseldorf, Germany ..... HERBERT GROSS

BUSINESS STAFF

Business Manager ..... J. W. ZUBER

Advertising:

Service Manager ..... C. H. BAILEY
Production Manager ..... A. V. ANDERSON
New York ..... E. W. KREUTZBERG
K. A. ZOLLNER, CALVIN FISHER, JR.
Pittsburgh .. S. H. JASPER, H. G. ROWLAND
Chicago ..... L. C. PELOTT, W. L. POLAND
Cleveland D. C. KIEFER, H. G. ROWLAND
Los Angeles ..... F. J. FULLER

Circulation Department:

Manager ..... G. R. EBERSOLE
Readers' Service ..... E. L. FRANKE

Circulation Representatives:

H. R. DUNNE, D. G. HEWITT, C. A. PRICE

Main Office:
Penton Building, Cleveland 13, Ohio
Main 1-8260

Branch Offices:

New York 17 ..... 60 East 42nd St.
Murray Hill 2-2581
Chicago 11 ..... 520 North Michigan Ave.
Whitehall 4-1234
Pittsburgh 19 ..... 2837 Koppers Bldg.
Atlantic 1-3211
Detroit 2 ..... 6560 Cass Ave.
Trinity 5-3024
Washington 4 ..... 1123 National Press Bldg.
Executive 6849
Los Angeles 4—130 N. New Hampshire Ave.
Dunkirk 2-1758
London, 2 Caxton St., Westminster, S.W. 1

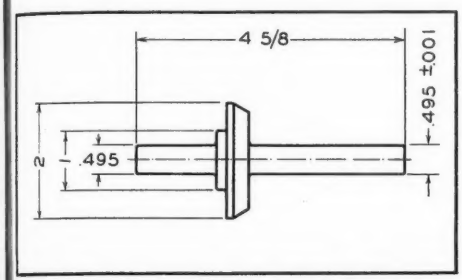
Published by
THE PENTON PUBLISHING COMPANY

Chairman ..... E. L. SHANER
President and Treasurer ..... G. O. HAYS
Vice Pres., Director of Adv. R. C. JAENKE
Vice Pres. and Secretary F. G. STEINEBACH
Assistant Treasurer ..... R. W. COLEMAN

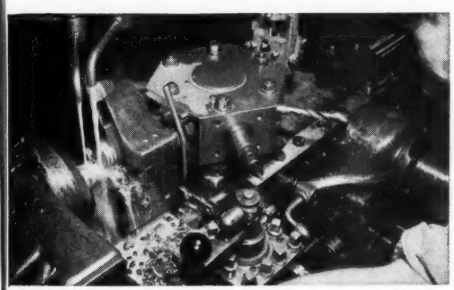
Also publisher of
FOUNDRY • MACHINE DESIGN
NEW EQUIPMENT DIGEST

Member, Controlled Circulation Audit, Inc., National Publishers' Association and Society of Business Magazine Editors.

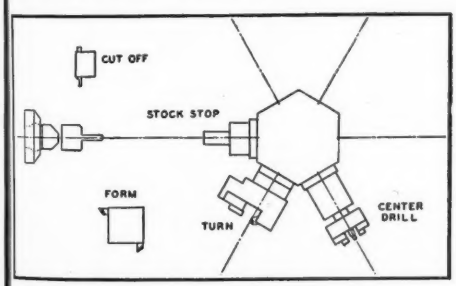
from 2" to ½" with ONE CUT



THE PART—*Type 410 Stainless Steel Valve made by O. C. Keckley Co.*



THE OPERATION—*Diameter of 2" bar is reduced to ½" in one cut, and .001" limits are held.*



THE METHOD—*Tooling Setup of the Warner & Swasey No. 5 Turret Lathe that produces this part. Standard Tools are used.*

¾" DEPTH OF CUT ON No. 5 WARNER & SWASEY HOLDS LIMITS OF ±.001"

THE O. C. KECKLEY COMPANY, Chicago valve manufacturer, machines the Valve Stem of their Type 410 Stainless Steel Valve, reducing the diameter from 2" to ½" with *one* pass of a Warner & Swasey Single Cutter Bar Turner. Spindle speed is 274 RPM, Feed: .012". The limits on this operation are ± .001".

You must have the best in machine tools to turn out jobs like this. Power, alone, is not enough. The machine and tools must be designed to provide maximum rigidity for heavy carbide cuts, as well as to have a surplus of power.

Keckley found out that Warner & Swaseys are the answer to their problem jobs. Why not see what Warner & Swasey Turret Lathes can do for you? Call your nearest Field Representative or write

WARNER & SWASEY SELLS ONE THING...
INCREASED PRODUCTION

WARNER & SWASEY
Machine Tools
Cleveland

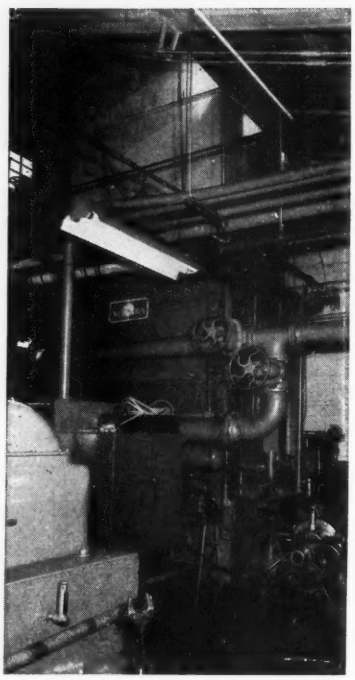
TURRET LATHES, MULTIPLE & SINGLE SPINDLE AUTOMATICS, PRECISION TAPPING AND THREADING MACHINES

You Get Trustworthy Liquid or Gas Cooling With Great Cooling Water Savings from the NIAGARA AERO HEAT EXCHANGER

● You can cool air, gas, water, oils, chemicals, electric and power and process equipment, engines, mechanical processes with lower cost and really accurate control of temperature with the Niagara Aero Heat Exchanger.

You are assured of uniform, constant production and quality from any process . . . steady, reliable operation . . . lower cost for more dependable cooling. You can have closed system cooling with freedom from scale, dirt, corrosion and maintenance troubles. You can accurately cool more than one type of liquid with one machine.

The Niagara Aero Heat Exchanger uses atmospheric air to cool liquids and gases by evaporative cooling. You can remove heat at the rate of input to keep accurate control of gas or liquid temperature. You can put heat back into the system to save the losses of a "warm-up" period or to equalize the effect of load variations.



Great savings in cooling water and savings in piping, pumping and power return the cost to you quickly. The Niagara Aero Heat Exchanger can save you approximately 95% of your cooling water cost. Write for Bulletin 96.

NIAGARA BLOWER COMPANY

Over 35 Years Service in Industrial Air Engineering

Dept. S , 405 Lexington Ave. New York 17, N. Y.

Experienced District Engineers in all Principal Cities

LETTERS
TO THE EDITORS

Hooray for Buyers' Guide

I have read your Guide for Steel Buyers in your January 15 issue; you are to be highly complimented on the complete and compact form in which you have accumulated all the different information on steel products.

C. E. Jones, Vice President
Agaloy Tubing Co., Springfield, O.

. . . You are certainly to be congratulated on the completeness of this compilation.

R. C. Garlick, Assistant Vice President and General Manager of Sales
Sharon Steel Corp., Sharon, Pa.

. . . I am sure that it will be very helpful to all steel consumers.

Howard V. Clark, Vice President in Charge of Sales
Detroit Steel Corp., Detroit, Mich.

. . . We believe you should be complimented on the very complete coverage that you have given this matter. We are producers of a single commodity, but quite a number of our customers ask us where they can obtain other steel commodities. A complete guide should be of great value to consumers of steel.

W. F. Graham, Vice President-Secretary
Keystone Drawn Steel Co., Spring City, Pa.

. . . The Guide for Steel Buyers which you have compiled is an excellent and much-needed piece of work. I am sure that steel buyers will come to consider it indispensable.

Leslie Irvine, Assistant General Manager of Sales
Wheeling Steel Corp., Wheeling, W. Va.

. . . We want to compliment you on the very fine presentation of the interesting information and tabulation appearing in your January 15 issue. This should be helpful to all buyers interested in purchasing steel of the various kinds listed in the guide.

Ray F. Eisenbies, Vice President in Charge of Sales
Shenango Tube Co., Sharon, Pa.

. . . You have done a remarkable job in assembling the information and I am sure the data will be of intense interest to anyone who manufactures, fabricates or warehouses finished steel products. Do you plan to print the guide separately for distribution?

John A. Ingwersen, Vice President
Armco Steel Corp., Middletown, O.

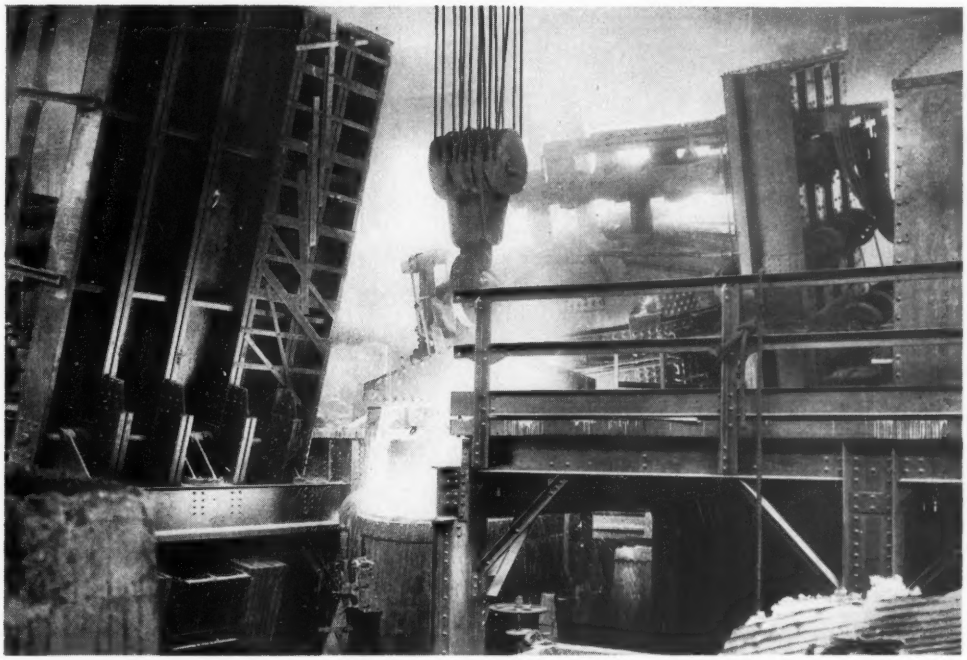
● *Copies of the 44-page guide, which contains about 14,000 listings, may be obtained from* STEEL*'s Readers' Service Department, 1213 W. Third St., Cleveland 13, O., at these prices: One to nine copies, 50 cents each; 10 to 24, 40 cents; 25 to 49, 35 cents; 50 or more, 30 cents.*

Colossal, That's All!

Thank you for the copy of STEEL's Metalworking Yearbook. The book certainly is a "colossal tome" and is a great help in any curricular and consulting work.

Henry C. Boynton
Trenton, N. J.

WIRE ROPE



Roebling Preformed lasts longer, performs better . . . saves wire rope dollars

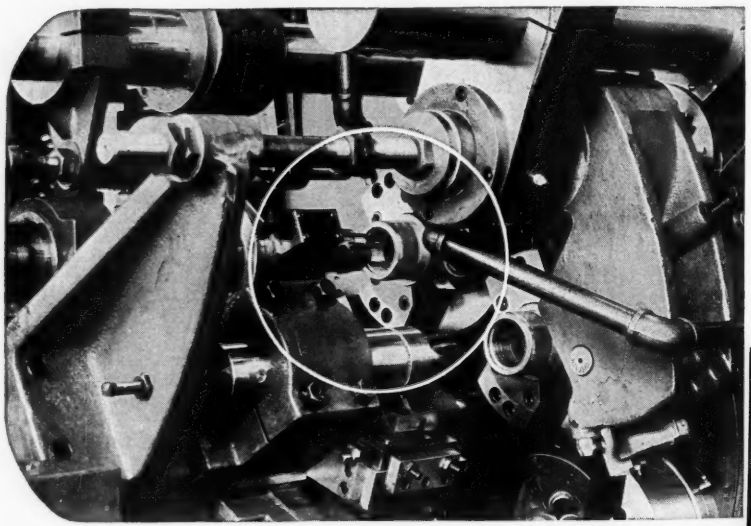
YOU PAY FOR THE BEST when you buy wire rope. And you *get the best* when you buy Roebling Preformed "Blue Center" Steel Wire Rope. "Blue Center" steel is an exclusive Roebling product . . . gives rope the extra toughness that spells long life . . . service economy that really counts. Besides that, Roebling Preformed can be cut without seizing . . . always spools better . . . reduces vibration and whipping . . . doesn't tend to set or kink.

Roebling makes a wide range of wire rope . . . brings you the right construction, grade and size for top performance and economy on each installation. Have your Roebling Field Man help select the *best* rope for your particular requirements. And for maximum savings, get his suggestions on the proper use and maintenance of wire rope. He knows the case histories of thousands of installations. John A. Roebling's Sons Company, Trenton 2, New Jersey.

ROEBLING

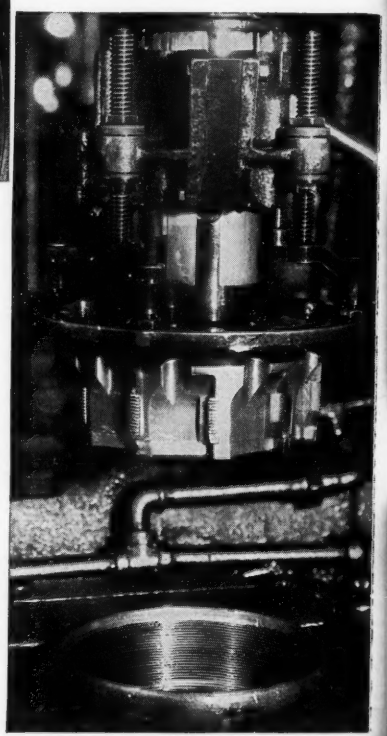
Atlanta, 934 Avon Ave ★ ***Boston,*** 51 Sleeper St ★ ***Chicago,*** 5525 W. Roosevelt Rd ★ ***Cincinnati,*** 3253 Fredonia Ave ★ ***Cleveland,*** 701 St. Clair Ave, N.E. ★ ***Denver,*** 4801 Jackson St ★ ***Houston,*** 6216 Navigation Blvd ★ ***Los Angeles,*** 216 S. Alameda St ★ ***New York,*** 19 Rector St ★ ***Odessa, Texas,*** 1920 E. 2nd St ★ ***Philadelphia,*** 230 Vine St ★ ***San Francisco,*** 1740 17th St ★ ***Seattle,*** 900 1st Ave, S. ★ ***Tulsa,*** 321 N. Cheyenne St

MANY THREAD DIAMETERS
WITH ONE LANDIS TAP



Detachable Heads Cut Wide Range of Internal Threads

The LANDIS Collapsible Tap is a many-purpose tool—yet a single-purpose tool. The versatility of the LANDIS Tap enables it to handle a wide variety of jobs—yet it handles each job as though it were a specially-designed tool.



WIDE THREAD CAPACITY

The ability to cut thread diameters of varying sizes is an outstanding feature of all LANDIS Taps. The thread-cutting head is detachable and tap heads of various sizes and capacities can be used interchangeably on the same tap body. This design makes it possible to cut an unusually-wide range of internal thread sizes with a minimum tool investment. For instance, the 5ALT Tap will cut threads from 1⅝" to 6⅝" in diameter.

EASY REMOVAL FROM WORK

LANDIS Taps are constructed with a built-in **collapsing** action. Chasers drop free from the work into the tap head at the completion of the thread. The tap can be removed directly without "backing out," thus saving labor time and chaser wear, and reducing the number of torn threads.

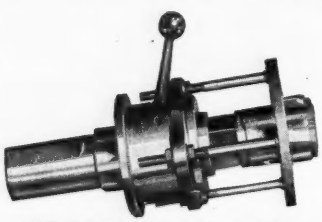
INTERNAL TAPERED THREADS

LANDIS Taps are of two types—the ALT for parallel threads—and the LL for tapered threads. The LL Receding Chaser Collapsible Tap is especially designed to cut API Standard threads in any machineable material well within all required tolerances. This tap features a new receding action—a fulcrumed lever—which gives a positive receding movement to the chasers and allows precision thread tapers. The low cutting strains thus obtained lengthen chaser life and improve thread accuracy and finish.

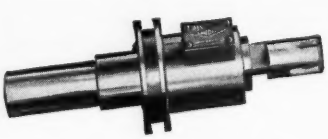
GENERAL FEATURES

LANDIS Taps can be used as stationary or rotary taps, and can be quickly converted from one type to the other. Left-hand threads may be cut with the same tap bodies, using left-hand tap heads. All taps have a fine size adjustment which allows compensation for wear and regrinding, and the style LL Tap can be adjusted to compensate for slight errors in taper.

Consider the money-saving features of LANDIS Taps in cutting internal threads in your plant. Write for Bulletins G-94 and G-95.



ALT Collapsible Tap arranged for use as a Stationary Tap.



LL Receding Chaser Collapsible Tap arranged for use as a Rotary Tap.

LANDIS MACHINE COMPANY

WAYNESBORO • PENNSYLVANIA

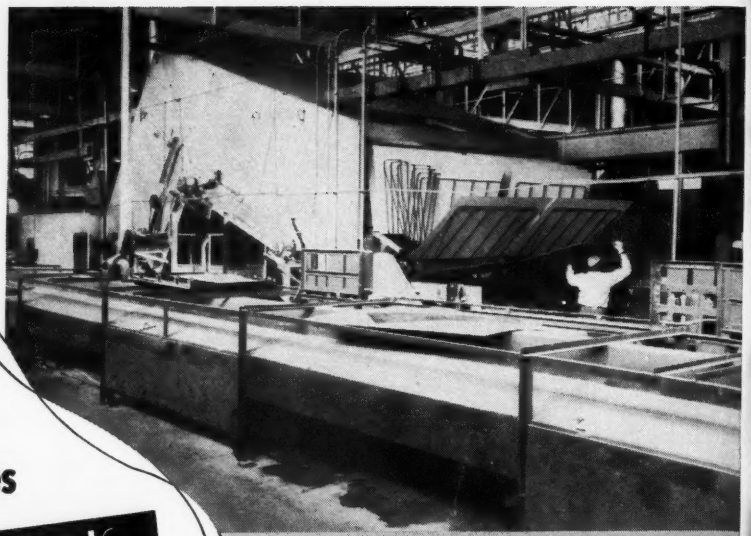
THREADING MACHINERY—THREAD CUTTING DIE HEADS—COLLAPSIBLE TAPS

Is it... or **isn't** it?

Just this one simple question, and no one dodges the answer. If it isn't... that's *that*. The customer never gets it. But then, it's mighty seldom that any order for Bristol Brass sheet, rod, or wire doesn't "mike up" to specifications. For Bristol Brass men know their business... in sales, engineering, production, inspection. And if you use Brass, they know *your* business, too. The Bristol Brass Corporation, Bristol, Conn., (makers of Brass since 1850). Offices or warehouses: Boston, Chicago, Cleveland, Dayton, Detroit, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Providence, Rochester

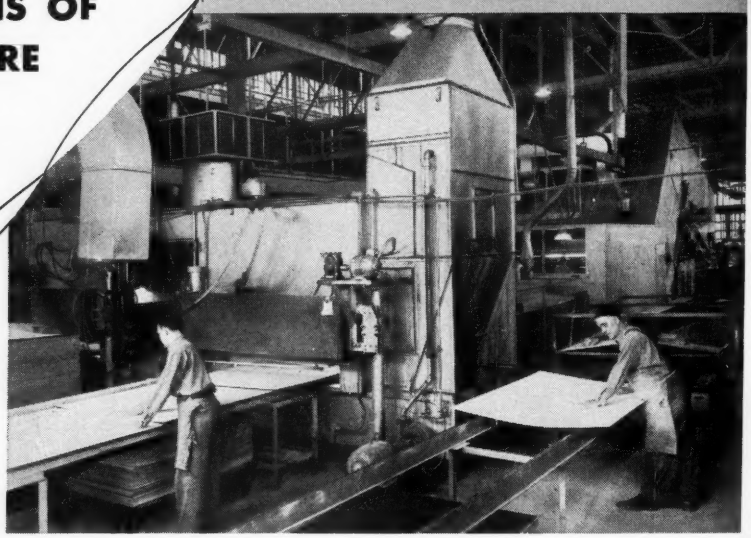
Another insight into the full meaning of: **"Brass made Bristol-Fashion"**

GAS bakes a clean enamel finish ON 15 TONS OF YANKEE FIBRE TILE A DAY



35-foot, direct Gas-fired oven bakes enamel on 4′ x 8′ Masonite tileboard sheets at Yankee Fibre Tile Manufacturing Co.

Enamel-sprayed panels move into 2-zone oven, where direct Gas-firing maintains high production rate, retains delicate colors.



BAKING ENAMEL IN DELICATE HUES requires precise temperature control and clear combustion to preserve pastel color values. Yankee Fibre Tile Manufacturing Co., Detroit, Michigan, recently replaced its battery of infra-red lamps with a specially-designed 2-zone Gas-fired oven which finishes top quality fibre tiling rapidly and economically.

The oven has thermostatically controlled zones operating at 275°F and 290°F. Air is heated by direct Gas-fired burners, and recirculated from high to low-temperature zone. Masonite tileboards 4′ x 8′ go through the Gas oven twice, once to bake the primer coat, and again for the enamel finish coat.

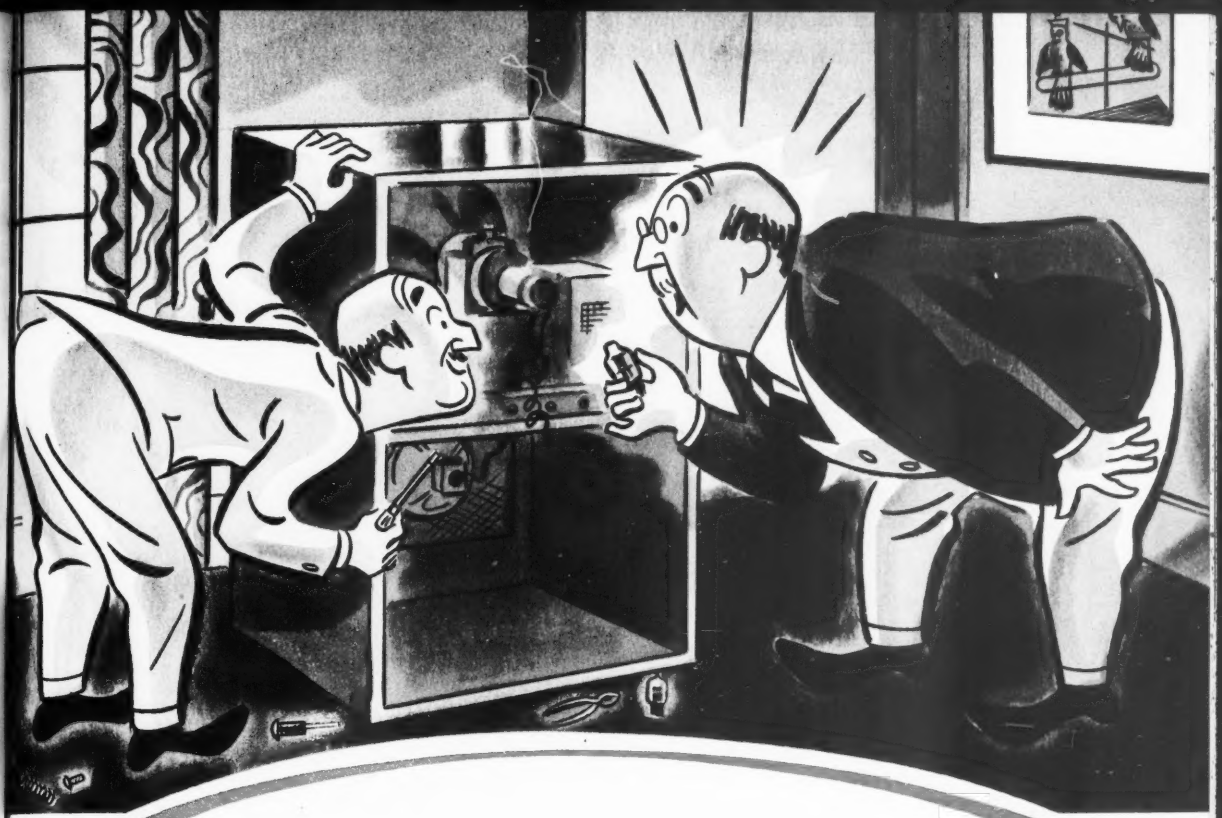
To produce 30,000 lbs. a day of Yankee Fibre Tile for bathrooms, in black, white and a wide range of colors, the manufacturer relies on clean, economical GAS. Gas provides the exact temperatures required, and puts a durable, clean enamel surface on Yankee Fibre Tile. Gas is just as readily adaptable to your special paint drying or ceramic firing needs. Your Gas Company Representative has the facts. Call him today.

MORE AND MORE ... THE TREND IS TO GAS FOR ALL INDUSTRIAL HEATING

Gas-fired oven built and installed by Young Brothers Co., Cleveland, Ohio

AMERICAN GAS ASSOCIATION

420 LEXINGTON AVENUE, NEW YORK 17, NEW YORK



"See how TV is THOMASIZED, Plunkett!"

Thomasize and save! Replace solid non-ferrous metals with pre-coated Thomas Strip. Cut costs. Conserve critical materials. Extend the material and fabricating economies of steel strip to parts once made of more costly metals. All without loss of product quality.

★ ★ ★

Look at Nickel-Coated THOMAS STRIP, for example, with its many functional applications in electronics, radio and television. Electrical manufacturers were quick to recognize its economy . . . equally quick in taking full advantage of them.

There's a cue for you in their experience. This cold-rolled strip steel electrocoated with nickel offers a broad choice of fabricating methods. Like other pre-coated Thomas products, it serves both as a final product finish and as a ready base for further plating. It helps retard corrosion, tarnishing and staining. It offers resistance to oxidation at elevated temperatures. It saves you the costs of operating plating equipment and cuts overhead all along the line.

Write us for test samples, and for metallurgical recommendations.

Electrolytically pre-coated with Zinc, Copper, Brass, Nickel and Chromium • In Natural, Planished and Buffed Finishes • Hot Dip Tin and Lead Alloy Coated • Alloy Strip Steel • Annealed Spring Steel • Uncoated Strip Steel • All Produced To Your Specifications.

THE THOMAS STEEL COMPANY • Warren, Ohio

Specialists in Cold Rolled Strip Steel

More Stampings at lower cost with the right CLEVELAND

Every Cleveland Press is designed and constructed to give top production at the lowest possible operating cost. Therefore you can expect uninterrupted high speed production because rugged construction minimizes vibration and deflection under load. The outstanding (patented) Cleveland Drum Type Clutch virtually eliminates clutch maintenance.

For peak efficiency select the right Cleveland for your particular requirements. Cleveland offers a wide selection of eleven types of power presses. Each is furnished in a wide range of sizes and capacities. Take advantage of our engineering service; our recommendations will not be restricted by limitations of type or size. Contact us today, for this free advisory service. A-3811

Cleveland Straight-Sided Double Crank Press double-geared, equipped with air friction clutch and 2 station electrical control.

FOUR POINT		TRIMMING
TWO POINT	S.S. DOUBLE CRANK	S.S. SINGLE CRANK
SINGLE POINT	OPEN BACK GAP	HORNING
DOUBLE ACTION TOGGLE	KNUCKLE JOINT	INCLINABLE

Stroke of Slide	16″
Adjustment of Slide	6″
Shut Height	30″
Base of Slide	44″ x 102″
Bed Area	50″ x 108″
Strokes per minute	12
Capacity	300 tons

PUNCHING TOOLS & DIES

OFFICES AT:
NEW YORK....CHICAGO
DETROIT....PHILADELPHIA
PITTSBURGH

THE CLEVELAND PUNCH & SHEAR WORKS CO.
U.S.A.

Established 1880

POWER PRESSES

FABRICATING TOOLS

CLEVELAND 14, OHIO

NATIONAL standardized brushes!

TRADE-MARK

Biggest advance in 50 years of industrial brush selling

● Here is a tremendous advance in industrial brush selling. National Carbon has set up a list of steel-mill brushes — for mill-type motors, for sk. motors, cd. motors, and other widely used types — which effectively covers the field. These brushes are the best ever made for this equipment. They will give you top performance. And you can get them at a *low, flat price — regardless of quantity* — so long as you order at least one box of brushes. You get the brushes quickly. They are kept in stock. Finally, you get the brushes in a sturdy, durable box. You get *better brushes* . . . at a *better price* . . . in a *better package.*

NATIONAL CARBON DIVISION
Union Carbide and Carbon Corporation
30 East 42nd Street, New York 17, N. Y.

Please send me complete information on National Carbon's new brush-standardization listings.

*Name*_____

*Street*_____

*City*_____ *State*_____

The term "National" is a registered trade-mark of

NATIONAL CARBON DIVISION
UNION CARBIDE AND CARBON CORPORATION
30 East 42nd Street, New York 17, N. Y.

District Sales Offices: Atlanta, Chicago, Dallas, Kansas City, New York, Pittsburgh, San Francisco

In Canada: National Carbon, Ltd., Toronto 4

the magnet that answers THE NEED

Dings New Improved Lifting Magnet . . . Weighs Less, Lifts More, and Lasts Longer

THIS latest Dings magnet has *all* the features necessary for maximum scrap yard performance. A few examples . . .

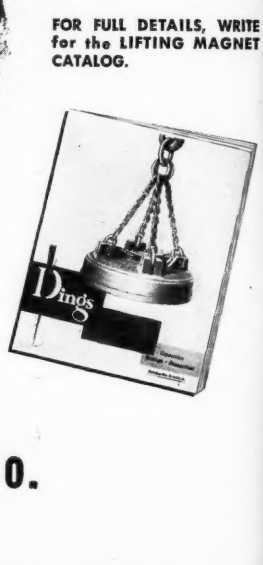
WELDED STEEL CONSTRUCTION—eliminates the moisture danger, makes a strong rigid magnet that can take the hard blows.

LIGHTER WEIGHT—*More* of the weight your crane is carrying will be payload. A balanced magnetic circuit of advanced design makes this difference.

MAXIMUM POWER, LONGER—No. 1 reason for this is less heat rise due to the improved magnetic circuit. In addition, a new, finer insulating compound dissipates strength-sapping heat, prevents electrical leakage between coil wires.

Those are the *big* new features. There are a dozen other important ones you'll be interested in.

FOR FULL DETAILS, WRITE for the LIFTING MAGNET CATALOG.



DINGS MAGNETIC SEPARATOR CO.
4710 W. Electric Ave., Milwaukee 46, Wis.

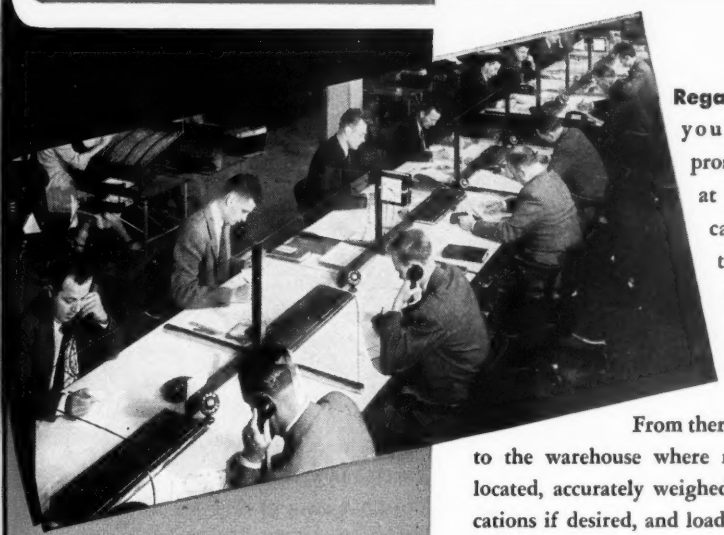
Dings *Certified* MAGNETIC STRENGTH

MEN and MACHINES

Serve You FAITHFULLY

...When You Order From

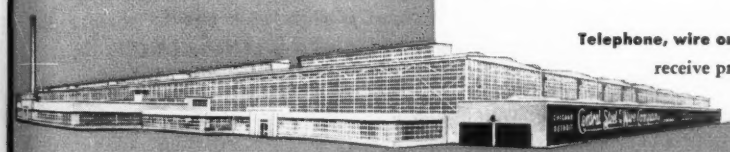
CENTRAL STEEL



Regardless of quantity, your order receives prompt, careful attention at Central Steel. Your call, taken by one of twenty-four men stationed at our direct-line, individual switchboard, starts the ball rolling. From there your order is routed to the warehouse where materials are quickly located, accurately weighed, cut to your specifications if desired, and loaded on trucks for fast, dependable delivery.

Whatever your metal requirements, call Central Steel first. We have the stock, the men, the equipment and the experience to serve you promptly and faithfully.

Telephone, wire or mail your order, it will receive prompt personal attention.



Complete Stocks of
Hot Rolled • Cold Finished
Carbon & Alloy • Stainless
Copper • Brass • Aluminum
Expanded Metal •
Structurals for
Immediate Delivery

Central Steel & Wire Company

CHICAGO 80, ILL.
P. O. Box 5310-A
REpublic 7-3000

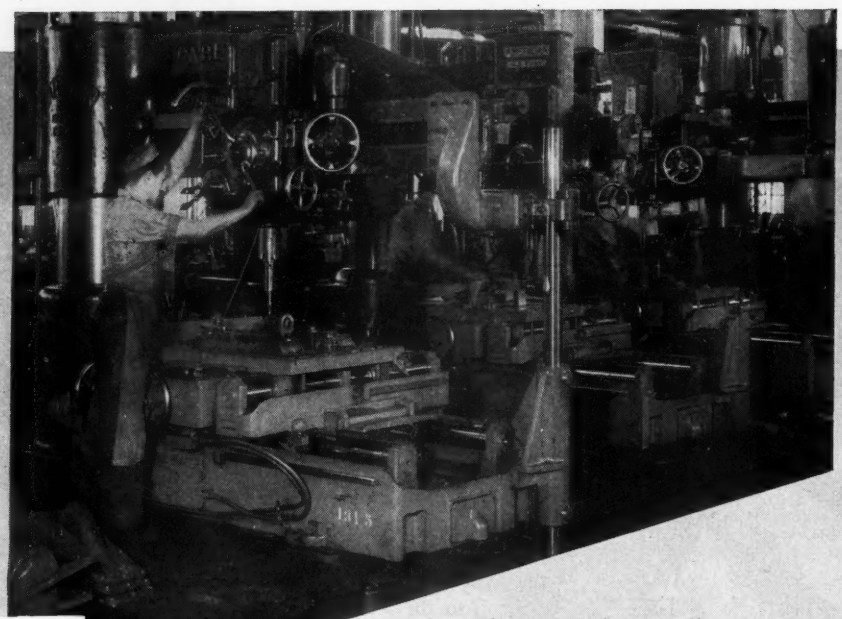
DETROIT 12, MICH.
13400 Mt. Elliott Ave.
TWinbrook 2-3200

CINCINNATI 14, OHIO
Box 148 Annex Sta.
AVon 2230

MILWAUKEE 14, WIS.
6623 W. Mitchell St.
EVergreen 4-7400

THE PRICE OF BULLARD SPACERS FROM THE COST OF JIGS

From 40 to better than 50% Operational Savings shown in Case Histories



ASK FOR A BULLARD SURVEY OF YOUR JOBS

•

WRITE FOR BOOKLET (INTER-SP-1)

Elimination of time and expense in the design and fabrication of drill jigs is an important factor in lowering manufacturing costs. Maintenance and handling of jigs are also NON-PRODUCTIVE operations. The investment in a BULLARD SPACER is quickly absorbed . . .

QUOTE FROM ONE USER: **"We have completed some forty (40) different jobs. The amount of pieces of each job is about thirty (30). The cost of making jigs for each one of these jobs would amount to, from $300 to $500 per jig, plus special cutting tools to be used with jig drilling and boring."**

THE BULLARD COMPANY
BRIDGEPORT 2, CONNECTICUT

Christendom was saved by steel

ALL day long, waves of Arab horsemen beat upon the ranks of Charles Martel's veteran militia. But time after time, the enemy cavalry recoiled before storms of iron-tipped javelins, their shining scimitars unsuccessful. On the second morning, the Saracen leader, Abderrahman, was slain, pierced with many spears. The Moslem horde fled back across the Pyrenees, never again to menace the Western world.

Time after time, as at Tours in 732 A.D., Christian civilization has been threatened by seemingly invincible enemies. Yet history proves that victory invariably has gone to the nation or alliance which excelled in the production and use of iron and steel.

In the present era of alarms and crises, it is reassuring to realize that America has greater capacity for making steel than all the rest of the world combined. Furthermore, the American steel industry is expanding at a rate far faster than that of all the dictator-directed economies behind the Iron Curtain. Our free and independent steel making and metal working industries can and will forge sinews for the peace we want or for the war we may be forced to fight.

So remember this: It is not only the threat of Muscovy to fear—America has itself to fear also—its misguided sentimentalists, its sheltered saboteurs—who seem to play communism's game by frittering away our strength and our resources.

QUALITY YOUNGSTOWN SERVICE

The Youngstown Sheet and Tube Company

General Offices—Youngstown 1, Ohio
Export Offices—500 Fifth Avenue, New York

MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

CONDUIT - PIPE AND TUBULAR PRODUCTS - BARS - RODS - COLD FINISHED CARBON AND ALLOY BARS - SHEETS - PLATES - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - TIE PLATES AND SPIKES.

Wherever You are...

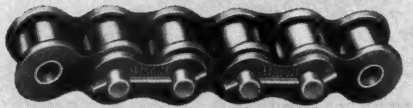
UNION CHAIN
is at your elbow

Suppose you need UNION Silent Chain

for a short center drive at unusually high speeds. If you are certain of the pitch, width, length and pinions required, write or phone your nearest Union Chain Stock Carrying Distributor listed on the facing page. It is an essential part of his service to give you the earliest possible delivery.

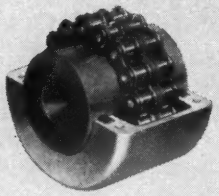
... *or suppose you need* engineering advice on the selection of a Union silent chain drive as an integral part of your own product. Then your cue is to communicate with Union Chain's nearest district office as listed at the top of the facing page. You will receive unprejudiced, competent help.

Unprejudiced because Union Chain makes all types of steel chains and is concerned only to provide each customer with the proper chain for top efficiency and minimum cost. ***Competent*** because all-round experience qualifies Union Chain specialists to make sound chain recommendations whether the application calls for silent chain, roller chain or one of the various heavy drive or conveying chains. We believe you can discuss your chain problems quite profitably with us.



UNION ROLLER CHAIN

UNION HEAVY DRIVE AND CONVEYING CHAINS



UNION
ROLLER CHAIN
FLEXIBLE COUPLINGS

UNION
SILENT CHAIN
FLEXIBLE COUPLINGS

CALIFORNIA
American Ch
C. A. Nichol
5511 Pacif
Huntington

GEORGIA
H. F. Edge
208 Walto
Atlanta, G

ILLINOIS
Union Chain
W. Albrecht
A. C. Mohr
B. Nelson
Room 123
53 W. Jac
Chicago,

INDIANA
Paul W. Hu
5745 Guilf
Indianapol

LOUISIANA
F. N. Johnst
2207 Ame
New Orlea

MASSACHUSI
Transmission
Stanley Johr
6 Hartford
Newton Hi

ALABAMA
Mill & Mine
124 S. 20t
Birminghan

ARKANSAS
Service Suppl
20 North
P.O. Box
Station
Fayettevill

CALIFORNIA
Valley Beltin
Equipme
2309 Los
Fresno, Ca

CONNECTICU
Motor Equip
Wall & W
Bridgeport

FLORIDA
Ellis & Lowe
302-306 S.
Tampa, Fl
Farquhar Ma
720 West
Jacksonvill
General Equi
Supply
532 N. W.
P.O. Box
Miami, Fla

GEORGIA
Bearings & P
515 Arch
Macon, Ge
Georgia Har
Supply
307 N. W
Albany, G
Macon Suppl
Macon, Ge
Richmond Su
Augusta, G
John D. Robi
13 Bay Str
Savannah,
J. M. Tull Me
285 Marietta
Atlanta 3,

ILLINOIS
Hagerty Bros
923 S. Wa
Peoria 2,
W. M. Hales
Hillsboro,
W. M. Hales
W. Frankfo

UNION CHAIN REPRESENTATIVES

CALIFORNIA
American Chain & Gear Co.
C. A. Nicholas
5511 Pacific Blvd.
Huntington Park, Calif.

GEORGIA
H. F. Edge
208 Walton Bldg.
Atlanta, Georgia

ILLINOIS
Union Chain & Mfg. Co.
W. Albrecht
A. C. Mehr
R. Nelson
Room 1232
53 W. Jackson Blvd.
Chicago, Illinois

INDIANA
Paul W. Huddlestun
5745 Guilford Ave.
Indianapolis 20, Indiana

LOUISIANA
F. N. Johnston Co.
2207 American Bank Bldg.
New Orleans, La.

MASSACHUSETTS
Transmission Engineering Co.
Stanley Johnson
6 Hartford St.
Newton Highlands 61, Mass.

MICHIGAN
Union Chain & Mfg. Co.
W. J. White
Basso Bldg.
7338 Woodward Ave.
Detroit 2, Michigan

MINNESOTA
F. H. Bathke
490 N. Snelling Ave.
St. Paul, Minn.

MISSOURI
J. B. Flaherty
5473 Delmar Blvd., Rm 206
St. Louis, Missouri

Ed Schiefelbein
311 West 10th St.
Kansas City 6, Mo.

NEW YORK
John B. Foley
107 Tully St.
Syracuse, New York

Mays & Gleason, Inc.
50 Church St.
New York 7, New York

Potter & Dugan, Inc.
29 Wilkeson St.
Buffalo, New York

NORTH CAROLINA
M. R. Snyder Co.
304 E. Tremont Ave.
P. O. Box 3341
Charlotte 3, N. Carolina

OHIO
Fred W. Borrow
3330 Montgomery Rd.
Cincinnati 7, Ohio

Union Chain & Mfg. Co.
F. H. Dalrymple
F. Smiley
Marshall Bldg.
Cleveland 13, Ohio

OREGON
J. W. Minder Chain & Gear Co.
307 S. E. Hawthorne Blvd.
Portland 14, Oregon

PENNSYLVANIA
David Davies
P. O. Box 4
Plymouth, Pa.

F. R. Magill Company
44 McKnight St.
Pittsburgh 20, Pa.

Union Chain & Mfg. Co.
John A. Shoemaker
Room 521
Schaff Bldg.
Philadelphia 2, Pa.

TEXAS
Union Chain & Mfg. Co.
J. H. Castleberry
E. T. Teal
205 Irwin-Keasler Bldg.
Dallas 1, Texas

VIRGINIA
C. Arthur Weaver Co.
403 E. Franklin St.
Richmond 19, Virginia

WISCONSIN
Union Chain & Mfg. Co.
George H. Harris
Room 508
Wisconsin Tower Bldg.
606 W. Wisconsin Ave.
Milwaukee 3, Wisconsin

SPECIAL Representatives

NEW YORK
Frank L. Allen
82 Wall St.
New York 5, New York

E. F. Gahan
500 Fifth Ave.
New York, New York

OREGON
W. D. Hollingworth
307 S. E. Hawthorne
Portland, Oregon

FOREIGN Representatives

ARGENTINA
Stevens & Villasuso
Muneeas 110
Tucuman, Argentina

CUBA
Central Machine & Trading Co., S.A.
Lamparilla 208
Havana, Cuba

HAWAII
P. S. Pell & Co.
88 S. Queen Street
Honolulu, T. Hawaii

MEXICO
Thomas M. Nevin Y. Cia. S.A.
Manuel Maria Contreras 58
Mexico, D. F., Mexico

PHILIPPINES
The Edward J. Nell Co.
1450 Arlegui St.
Manila, Philippines

PUERTO RICO
Manual, Palos, Jr.
P. O. Box 2969
San Juan 13, Puerto Rico

SOUTH AFRICA
Robins Conveyors (South Africa) Ltd.
Somkay House
Cor. Troye & Marshall Sts.
P. O. Box 4736
Johannesburg, S. Africa

UNION CHAIN STOCK CARRYING DISTRIBUTORS

ALABAMA
Mill & Mine Supply Company
124 S. 20th Street
Birmingham, Alabama

ARKANSAS
Service Supply Company, Inc.
20 North University Street
P.O. Box 145, University Station
Fayetteville, Arkansas

CALIFORNIA
Valley Belting & Equipment Co.
2309 Los Angeles St.
Fresno, Calif.

CONNECTICUT
Motor Equipment Co.
Wall & Water Sts.
Bridgeport 3, Connecticut

FLORIDA
Ellis & Lowe Co., Inc.
302-306 S. Morgan St.
Tampa, Florida

Farquhar Machy. Co.
720 West Bay St.
Jacksonville, Florida

General Equipment & Supply Co.
552 N. W. 5th Street
P.O. Box 1470
Miami, Florida

GEORGIA
Bearings & Drives, Inc.
515 Arch Street
Macon, Georgia

Georgia Hardware & Supply Co.
307 N. Washington St.
Albany, Georgia

Macon Supply Co.
Macon, Georgia

Richmond Supply Co.
Augusta, Georgia

John D. Robinson Co.
13 Bay Street, West
Savannah, Georgia

J. M. Tull Metal & Supply Co.
285 Marietta St. N. W.
Atlanta 3, Georgia

ILLINOIS
Hagerty Bros. Co.
923 S. Washington St.
Peoria 2, Illinois

W. M. Hales Co.
Hillsboro, Illinois

W. M. Hales Co.
W. Frankfort, Illinois

ILLINOIS
Mid-States Industrial Corp.
2401 Eleventh St.
Rockford, Illinois

Northern Illinois Supply Co.
Carpentersville, Illinois

INDIANA
Diamond Supply Co., Inc.
616-24 N. W. Second St.
Evansville, Indiana

Service Equipment Center, Inc.
Indianapolis, Indiana

The South Bend Supply Co.
South Bend, Indiana

KANSAS
Bearing Service Co.
341 N. St. Francis Ave.
Wichita 2, Kansas

W. A. Thomas Supply Co.
112-114 West Third St.
Pittsburg, Kansas

KENTUCKY
Sherman Bros. Mill Supply
222 South Shelby St.
Louisville 2, Kentucky

LOUISIANA
Dixie Bearing & Supply Co., Inc.
733 N. 21st St.
Baton Rouge, La.

Weaks Supply Co., Ltd.
Monroe, Louisiana

Woodward Wight & Co., Ltd.
New Orleans, La.

MARYLAND
Hagerstown Equipment Co.
Maryland Ave. & Memorial Blvd.
Hagerstown, Md.

M. F. Holland Co.
Lee & Sharp Sts.
Baltimore, Md.

MINNESOTA
Jurgens Company
519 Cleveland Ave.
St. Paul 4, Minnesota

MISSOURI
Industrial Equipment Corp.
325 E. Walnut St.
Springfield, Missouri

Teuscher Pulley & Belting Co.
801-805 N. Second St.
St. Louis, Missouri

Wildhagen Machine & Supply Co.
224 S. Third St.
St. Joseph 5, Missouri

NEW JERSEY
Burton Supply Co.
390 Union Ave.
Paterson, New Jersey

NEW JERSEY
Mill Supply & Hardware Co.
285-289 N. Willow St.
Trenton 4, New Jersey

Old Reliable Supply & Equipment Co.
11th St. & Newton Ave.
Camden, New Jersey

NEW MEXICO
Union Industrial Corporation
112 East Mermod St.
Carlsbad, New Mexico

NEW YORK
Laurence Belting Co.
111 Chambers St.
New York, New York

S. H. Pooley Belting Co.
38 W. Seneca Street
Buffalo 2, New York

Transmatic Equipment Co.
11 North Pearl St.
Albany, New York

U. & S. Inc.
Lincoln Bank Bldg.
509 S. W. Street
Syracuse, New York

Ulster Foundry Corp.
20 St. James St.
Kingston, New York

NORTH CAROLINA
Piedmont Mill Supply Co.
P. O. Box 130
Salisbury, N. Carolina

OHIO
Brubaker Gear & Mfg. Co.
Barberton, Ohio

Cincinnati Transmission Co.
3330 Montgomery Road
Cincinnati 7, Ohio

C. J. Edwards Company
5005 Euclid Avenue
Cleveland 3, Ohio

Lima Armature Works, Inc.
440 N. Main St.
Lima, Ohio

Mill & Factory Supply Co.
317—10th St.
Toledo, Ohio

Wilkof Hardware & Supply Company
1100 Warner Road, S. E.
Canton, Ohio

Winkle Electric Co., Inc.
701 Andrews Avenue
Youngstown 2, Ohio

OKLAHOMA
C. F. Dagwell & Company
816 W. Main St.
Oklahoma City, Okla.

OKLAHOMA
Ore Reclamation Company
301 N. Connell Ave.
Pitcher, Oklahoma

OREGON
Electric Steel Foundry
Eugene, Oregon

Fisher Bros. Company
522 Bond Street
Astoria, Oregon

Industrial Machinery & Supply Co.
1410 Adams Avenue
La Grande, Oregon

Industrial Steel & Supply Co.
North Bend, Oregon

PENNSYLVANIA
A. C. Supply Company
1330 Federal Street
Philadelphia, Pa.

Ace Bearing Company
246 Hamilton St.
Allentown, Pa.

Ace Bearing Company
P. O. Box 183
1120 Wyoming Avenue
Scranton 1, Pa.

S. S. Brenner
2303 E. Philadelphia Street
York, Pa.

Industrial Supply Co.
451 E. Broad St.
Hazleton, Pa.

Maximon Machine Co.
801 N. Logan Blvd.
Altoona, Pa.

Reilly Bros. & Raub
44 N. Queen St.
Lancaster, Pa.

Transmission Equipment Co.
903 E. Carson St.
Pittsburgh 10, Pa.

SOUTH CAROLINA
Crawford & Garner, Inc.
Greer, S. Carolina

O'Brian Debnam Company
213 E. Evans St.
Florence, S. Carolina

Southern Mill Supply Co.
Summerville, S. Carolina

Thackston-Davis Supply Co.
828 Gervais Street
Columbia, South Carolina

TENNESSEE
Hoyt N. Payne Co.
P. O. Box 942
410 E. Depot Ave.
Knoxville, Tenn.

TENNESSEE
Tennessee Machinery Co.
114-119 Third Ave., South
Nashville 3, Tenn.

Tipps Engineering & Supply Co., Inc.
260 N. Front St.
Memphis, Tenn.

TEXAS
Allied Belting & Trans. Co.
2614 Sylvan Ave.
Dallas, Texas

Beacon Supply Co., Inc.
1825 Washington Ave.
Houston 10, Texas

El Paso Machine Works, Inc.
1600 E. 4th St.
El Paso, Texas

Great Western Supply Co.
14th & Throckmorton
Fort Worth, Texas

Lloyd Electric Co.
511 El Paso St.
San Antonio, Texas

Overton & Mims, Inc.
2703 Main St.
Dallas, Texas

Overton & Mims, Inc.
1307 Indiana
Wichita Falls, Texas

VIRGINIA
Blue Ridge Hardware & Supply Co.
Bassett, Virginia

Mill Supplies Corp.
South Norfolk, Va.

WASHINGTON
Electric Steel Foundry
1327 Washington St.
Spokane, Washington

WEST VIRGINIA
Bluefield Hardware Co.
Bluefield, W. Va.

Smith Steel Supply Co.
150 Peninsula St.
Wheeling, W. Va.

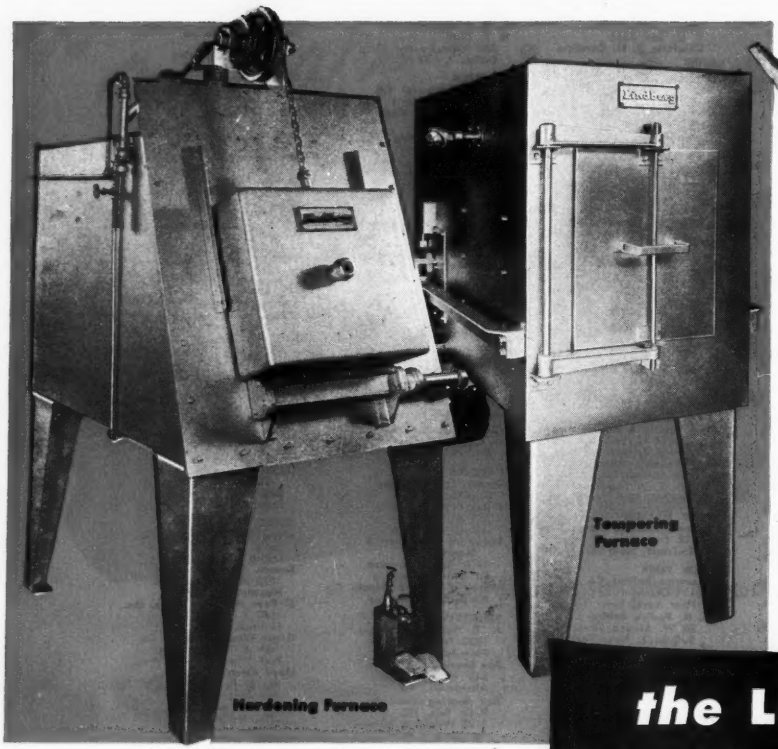
WISCONSIN
Dale Industrial Supply Co.
528 Forest St.
P. O. Box 867
Wausau, Wisconsin

Richard E. Ela Co.
744 Williamson St.
Madison, Wisconsin

Spence Corporation
2045 West St. Paul Ave.
Milwaukee, Wisconsin

The Union Chain and Manufacturing Company Sandusky, Ohio, U.S.A.

TRANSMIT POWER
UNION CHAINS
CONVEY MATERIALS



BASIC FOR EVERY TOOLROOM

the LINDBERG TOOLROOM TEAM

When production depends on tools and dies, tools and dies depend on the LINDBERG TOOLROOM TEAM—a basic requirement in every toolroom—a must where you want the ultimate in tools and dies which will keep your production rate up and your machinery running with a minimum of tool and die failure. The LINDBERG TOOLROOM TEAM gives you the precision heat treating which your precision tools and dies need for lasting performance.

LINDBERG HARDENING FURNACE—eliminates finishing due to scale and decarb with simple accurate atmosphere control.

LINDBERG TEMPERING FURNACE—allows you to obtain the exact "Rockwell Hardness" required for each specific tool or die.

For tools and dies requiring high speed tool steel—investigate the Lindberg "L" Type combination preheat—high heat Furnace.

LINDBERG FURNACES

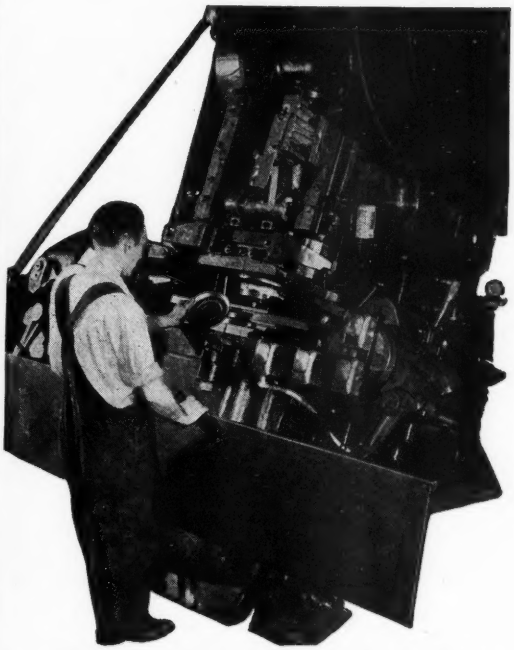
Specify LINDBERG

for any heat treating or melting need!

Lindberg manufactures every type and many sizes of melting and heat treating furnaces from tiny laboratory units to mammoth field erected installations —whether it's gas, oil, electric, arc, low or high frequency. When planning your heat treating or melting installation, consult your local Lindberg Office!

LINDBERG ENGINEERING COMPANY • 2441 W. Hubbard St., Chicago 12, Ill.

How Bliss Engineers helped Clemson Bros., Inc. produce new lawnmower



Outer Wheel Discs of .049 steel are blanked and formed...54 a minute, in No. 28 press with Bliss double-roll feed, scrap shear and die cushion. Special cam KO speeds ejection of disc. Stock is automatically fed from Bliss coil cradles with seven-roll straightener. A loop control starts and stops stock exactly as required.

Customer's Cost Kept Down by Bliss Recommending Both Equipment and Methods

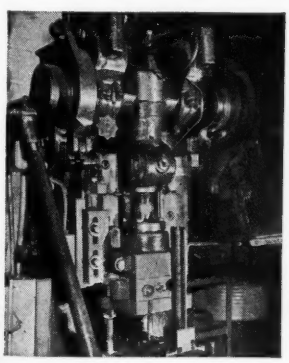
When Clemson Bros., Inc., of Middletown, New York, decided in 1947 to produce a new light-weight lawnmower featuring pressed metal stampings, they invited Bliss to recommend equipment and methods. Assuming responsibility for both presses and dies, Bliss prescribed equipment with high-production capacity requiring a minimum of manpower. Beyond this, Bliss helped Clemson hold capital investment at a minimum by offering its standard general-purpose inclinable presses fitted with special Bliss feeds and other accessories.

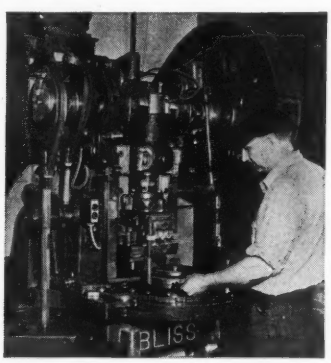
Concluding a highly successful first year manufacturing the new lawnmower, Clemson's production manager says: "Our Bliss presses have proved themselves to be highly efficient machines on large and small jobs. We have had little maintenance; they have actually been trouble-free. All the Bliss feeders have functioned perfectly since the day they were put in operation."

As the world's largest manufacturer of all types and sizes of presses, Bliss is in a unique position to counsel on the selection of the right press for a given job. Next time you have a metal-stamping problem, ask Bliss about methods and equipment. Your Bliss representative will welcome the opportunity to service your requirements.

E. W. BLISS COMPANY, CANTON, OHIO

Mechanical and Hydraulic Presses, Rolling Mills, Container Machinery





Operator Cares for Two Presses. Bearing cups are semi-coined from .080 steel blanks (left) in No. 20-B press with automatic stack feed. Finish coining and punching is done at right in geared 20-B press with 20-station dial feed. Production is 32 a minute.

JUST OFF THE PRESS!

Completely New
700 Pages
450 Illustrations

Sections on: Easy methods of computing press jobs How to select the proper type of press • Useful engineering tables • Die illustrations • Glossary of terms used in the pressed metal industry.

Plus a complete service section covering all types of Bliss presses, old and new. $7.50

E. W. Bliss Company—Handbook Dept.
Canton, Ohio

From the right press for a given job . . . to a complete press room . . . **It's Bliss**

High Strength

for reduction of

STAINLESS, HIGH SPEED and AIRCRAFT QUALITY STEELS

BIRDSBORO 50 ROLLS PATENTED

●Extremely strong and tough, Birdsboro 50 Rolls have the physicals needed for blooming, cogging and roughing hard-to-handle yet rollable high-percentage alloy type steels—Aircraft Quality, Stainless and High Speed Steels.

These rolls are specifically designed for the jobs they have to do—"custom-built" to your specifications. If you have had any trouble rolling billets and ingots of these "temperamental" steels—get in touch with our roll engineers. They can show the way to increased output at low cost with Birdsboro 50 Rolls.

BIRDSBORO TYPE ROLLS

*Birdsboro "30"
*Curoloy
Birdsboro "40"
Super Curoloy
Birdsboro "50"
Grainloy
Birdsboro Metal
Superloy
*Diamondite

FOR

Blooming
Cogging
Roughing
Semi-Finishing
Finishing

*Patented

Birdsboro Steel Foundry & Machine Co. • Birdsboro, Pa.

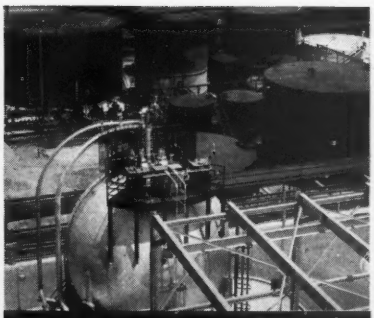
Offices in: BIRDSBORO, PA. & PITTSBURGH, PA.

BIRDSBORO ROLLS

R-4-50

DESIGNERS and BUILDERS OF:
Rolls • Crushing Machinery • Steel Mill Machinery • Hydraulic Presses • Steel Castings • Special Machinery

No-Ox-Id "A Special" guards dome and base of 3-million gal. water tank against corrosion.



Weather-resistant No-Ox-Id Resinous Coatings protect exterior metal surfaces from rust.

Attractive No-Ox-Id Aluminum adds years of service life to valuable plant equipment.

No-Ox-Id 558 protects internal combustion engines from rust during storage and shipment.

Roller bearings are dipped in No-Ox-Id 580 for long-lasting protection before being packaged.

Plowshares receive a protective coat of No-Ox-Id 500 before crating for export shipment.

THE CORRECT NO-OX-ID WILL PREVENT RUST WHEREVER IT IS APT TO OCCUR

Rust is an enemy of every plant—an enemy of many products!

Inside your plant—in outbuildings—storage tanks—cranes and other equipment, rust is constantly, silently at work increasing your operating costs—eating into your profits.

If you manufacture products of iron, steel or aluminum—here too you are faced with loss through corrosion. The inventories on your shelves—the products shipped on order are subject to this insidious enemy of metal.

The answer is a simple one—prevent rust and corrosion by coating all metal surfaces with the *correct* NO-OX-ID.

There is no such thing as a single "cure-all" preventive of rust to fit every requirement. The Dearborn Chemical Co. has prepared a complete line of NO-OX-ID rust preventives to meet every industrial requirement. By using the *correct* NO-OX-ID for each job, you assure maximum protection for your plant, for your product.

DEARBORN CHEMICAL COMPANY

***General Offices:* 310 South Michigan Avenue • Chicago 4, Illinois**

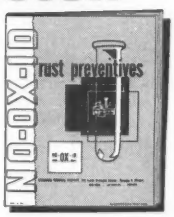
Dearborn

Reg. U. S. Pat. Off.

NO — OX — ID

IRON + OX = RUST

THE ORIGINAL RUST PREVENTIVE



WRITE FOR THIS VALUABLE BOOKLET

A complete introduction to Dearborn No-Ox-Id with valuable information to help you protect against rust in your plant and on your product. Mail the coupon.

DEARBORN CHEMICAL CO.,
310 S. Michigan Ave., Dept. S
Chicago 4, Ill.

Gentlemen: Please send me a copy of your booklet on *No-Ox-Id Rust Preventives.*

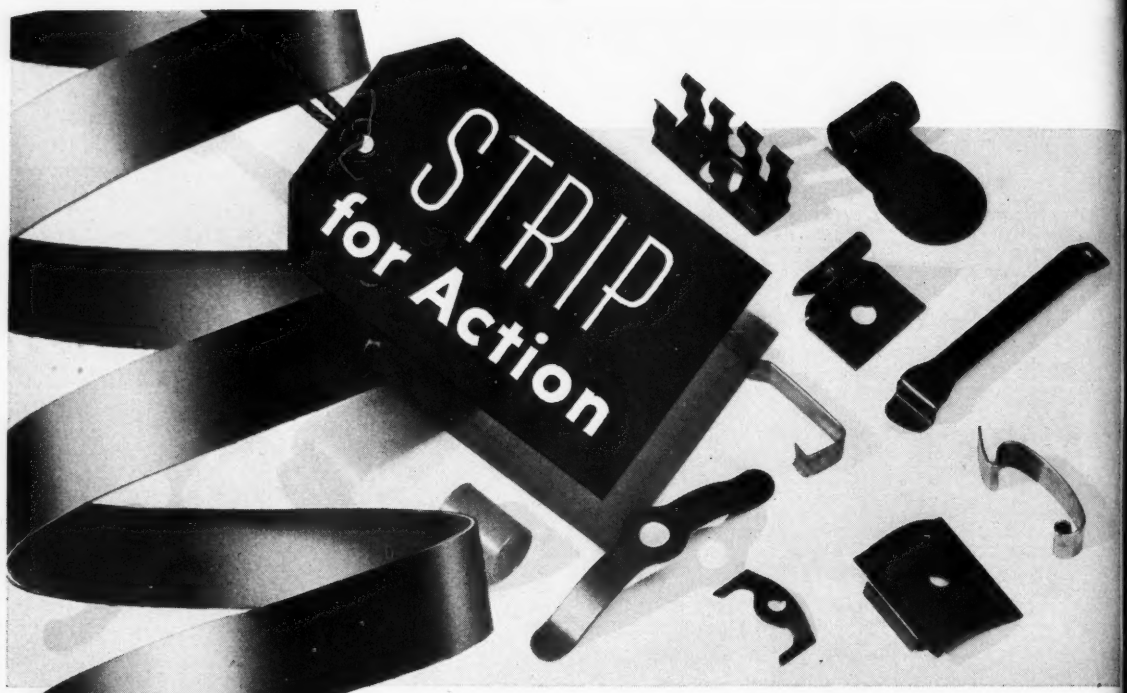
Name.....

Company.....

Title.....

Address.....

City.....*State*.....



The efficient action of a Flat Spring is dependent upon the quality of the STRIP STEEL.

WASHBURN

has over 50 years of experience in solving spring steel problems, to guarantee the quality of your product.

Flat Tempered and Untempered Wire in .50 to 1.25 Carbon Range.

Flat Cold Rolled Strip 6" and Narrower, Bright, Galvanized, Tinned and Cadmium Finish.

Round Untempered Low and High Carbon Spring Wires.

WASHBURN WIRE COMPANY, NEW YORK CITY

WASHBURN

CLEAN, UNIFORM BILLETS - STRIP - RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

Job-Engineered" means tailored to your crane needs

When you buy a crane, you want dependable service for many years to come. Your P&H "Job Engineered" crane will be built to meet your requirements to insure dependability . . . ample reserve capacity . . . adequate service factor . . . maximum safety. All P&H electrical equipment is designed and built by P&H for crane service — not adapted for it.

"Job Engineered" is an Added Value which comes with P&H's 65-year experience in crane-building — to serve your needs *exactly*.

And here's a fact worth remembering: P&H Cranes are sold and serviced by factory-trained men — not agents.

P&H Magnetorque* is the greatest advancement in AC crane control in the past 40 years. Ask about it.

*T. M. of Harnischfeger Corporation for electro-magnetic type brake.

EXCAVATORS • OVERHEAD CRANES • HOISTS • ARC WELDERS AND ELECTRODES • SOIL STABILIZERS • CRAWLER AND TRUCK CRANES • DIESEL ENGINES • CANE LOADERS PRE-ASSEMBLED HOMES

P&H

OVERHEAD CRANES
4411 West National Avenue
Milwaukee 14, Wisconsin

HARNISCHFEGER CORPORATION

Write for your copy of Bulletin C-39 describing P&H Magnetorque control.

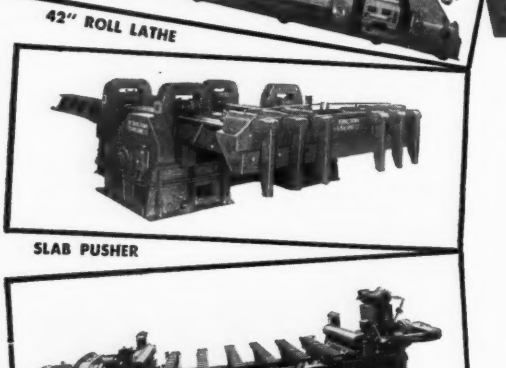
OVER 17,000 P&H CRANES SERVE AMERICAN INDUSTRY . . . FAR MORE THAN ANY OTHER

F&Ym EQUIPS THE NATION'S STEEL MILLS *to Speed Production*

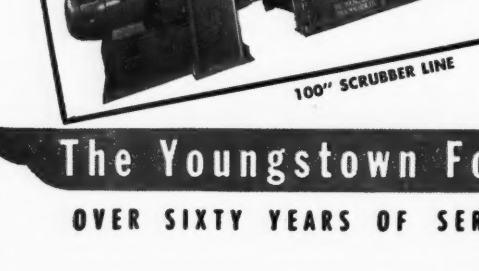
PLATE MILL TABLES

MACHINES, EQUIPMENT, ROLLS AND CASTINGS

PARALLOY ROLLERS


42" ROLL LATHE

SLAB PUSHER


90" x 240" STRETCHER LEVELER

100" SCRUBBER LINE

Check this List for the Products You Need

- PARALLOY ROLLS (Pinch, Coiler, Tension, Steel Mill)
- HYDRAULIC SLAB AND BILLET PILERS
- STRIP AND SHEET OILING EQUIPMENT
- SHEET SCRUBBER AND CLEANING LINES
- HOT SAWS—ROCKING AND SLIDE TYPES
- HOT BEDS—COOLING BEDS—TRANSFERS
- BILLET EJECTORS—PINCH ROLL STANDS
- SLITTERS—SPECIAL SHEARS AND GAUGES
- TILTING TABLES—Traveling and Lifting Tables
- Continuous PICKLING Lines—ROLLER LEVELERS
- FURNACE Charging Equipment—Furnace Pushers
- Strip Steel COILERS and REELS—SCRAP BALLERS
- RAILROAD Spike Forming Machines—ROLL LATHES
- Sheet GALVANIZING Lines—Wire Patenting Frames
- Stretcher Levelers—Angle and Shape Straighteners
- Rolling Mill Tables—Gear and Individual Motor Types
- DUCTILE CASTINGS (80,000 PSI.)

Machinery Built to Customer's Design and Detail Drawings

The Youngstown Foundry & Machine Co.

OVER SIXTY YEARS OF SERVICE TO THE STEEL INDUSTRY

Youngstown, Ohio

F&Ym

ELECTRODES

cut welding costs all along the line

OPERATOR

"easy to use"

"I like G-E rods because they are easy to use—I can make more welds per day. And no matter what sort of welding work I have to do, ordinary or special, there's always a 'right' G-E rod for the job."

WELDING ENGINEER

"excellent mechanical properties"

"We can more than meet our specifications by using G-E electrodes. They have excellent mechanical properties—high tensile strength, good ductility, and soundness."

PLANT MANAGER

"for fast and economical production"

"Our plant aims for fast, economical and quality production. At the same time, we want to keep our operators happy with the tools we provide. We chose G-E electrodes because they do both jobs."

PURCHASING AGENT

"high quality product at right price"

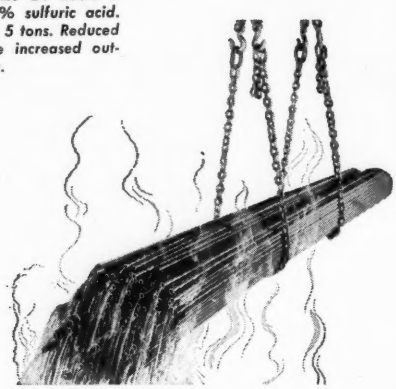
"By using G-E electrodes we get a high quality product at the right price—and get it promptly. We can get prompt service right from our local distributor."

Order arc-welders, electrodes, accessories, and renewal parts from your G-E Welding Distributor. For more information, write: Apparatus Dept., General Electric Co., Schenectady, N. Y.

GENERAL ELECTRIC

711-14

Former chains on these mechanical picklers used to fail in 2½ months. Monel chains are giving 1½ years' service 24 hours a day in hot, 10% sulfuric acid. Average load is 5 tons. Reduced shut-downs have increased output substantially.



Monel sling chains handling 4 to 5 tons of steel tubing. 75 such chains are in this plant. Where 1¼" chains of another metal failed in 9 months, these Monel chains have already served 6 years.

The Life is longer
The Weight is less
The Metal is Monel

Monel® Pickling Chain—like *any* piece of Monel pickling equipment—pays for itself.

Any pickling-room foreman or superintendent who has used Monel will tell you that.

For he knows that Monel's superior resistance to corrosion by hot pickling acids and fumes means longer life and greater safety.

He knows, too, that the higher strength of Monel makes it possible to use *lighter* chain that saves up to 20% in dead weight.

Monel link chain is formed from hot-rolled rod, and welded. The welds retain all the strength and all the corrosion resistance of the parent metal.

Regular Monel chain ranges in size from ¼" to 1¼". In addition, special types of sprocket chain, as well as a complete line of accessories such as hooks, lifting links, U-bolts and open links are available.

Whether you are using chain as slings or in mechanical picklers, you'll get the maximum in safety, long life and light weight, if you make that chain *Monel!*

Mechanical pick'er chains made of Monel for use in the pickling of steel pipe prior to galvan'zing. Chains are so designed to permit quick and easy replacement of any individual part.

Although Nickel and Nickel Alloys are currently in short supply INCO advertisements will continue to bring you news of new products, applications, and technical developments.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

EMBLEM OF SERVICE INCO TRADE MARK

Monel PICKLING EQUIPMENT

extra life
extra capacity
extra safety

The Metalworking Outlook

Wage Freeze Problem: Escalator Clauses

Federal wage stabilizers may stumble on the "escalator clause" in March. Then, their stabilization policy could trip when many General Motors-type cost-of-living contracts come up for review. About 1 million workers are covered in a formula that will call for automatic pay boosts of 4 to 6 cents an hour because of cost-of-living increases. The labor-sympathizing administration has this choice: Allow the automatic increases despite wage stabilization and try to patch the damage that results; or, refuse the boosts, disrupt the labor-management accord in the crucial auto industry and bear the wrath of the CIO.

How the U.S. Will "Solve" It

A good bet: The administration will take the former course. Watch for a "compromise" along lines advocated by the Political Action Committee of the CIO. It favors the same standard set up for cost-of-living advances as for general raises—a limit on escalator boosts so that total wages won't go more than 10 per cent above the level of last June. The CIO wants the same deal on pension payments and other items.

Chain Reaction in Prices

The damage to the price line cause by wage concessions will be terrific. Beginning this spring will come a long series of price concessions, too. They'll probably arrive piecemeal, then will start all over when the next quarterly wage adjustment is granted. Then . . . but why repeat?

Inventory Edicts Bring Gripes

National Production Authority may set up an Inventory Appeals Board to cope with the rising tide of complaints about inventory restrictions stipulated in NPA Regulation 1 as amended and supplemented. The Iron & Steel Division is bearing the brunt of those gripes.

NPA Under Fire

Look for other changes in the NPA setup. The agency got a thorough drubbing in a report on its effectiveness by the Senate Small Business Committee. The report cites NPA for its "lack of knowledge and experience of the broad problems of World War II mobilization techniques." It also says NPA "has shown a lack of both energy and imagination in getting its program across to the business community."

Fewer Autos by April

Expect a voluntary agreement by auto makers to curb assemblies by 20 per cent as of Apr. 1. The cutbacks will be even sharper later. The reason: Assemblers are using 20 or 30 per

Production-Engineering News—p. 71 *The Market Outlook—p. 117*

The Metalworking Outlook (Continued)

cent less aluminum and copper as they promised, but the nonferrous shortage is not curtailing auto production and steel consumption as much as expected because industry engineers are developing good substitutes. Detroit hopes a voluntary agreement will forestall mandatory federal action.

Reserve Plants Activated?

Hint that the real flood of defense orders will be breaking by spring: Washington is rushing inspections of reserve plants. About 500 plants are under government control, with 253 in reserve or on a standby basis. Defense procurement for this and the next, 1952, fiscal year will total about $87 billion over and above housekeeping expenses such as personnel costs of the armed forces.

Negotiations in New England

An established steel company will probably operate the New England steel mill to be built in the New London, Conn., area. Three firms are reportedly considering the job. Bethlehem Steel Co. is aiding in the study of the economics of the project. Its management of the proposed facility would tie in with its other seaboard activities . . . Purchase of Worth Steel Co. at Claymont, Del., by Colorado Fuel & Iron Corp. is expected to lead eventually to the erection of another blast furnace and more coke ovens along the Delaware river (p. 54).

Signs of the Times

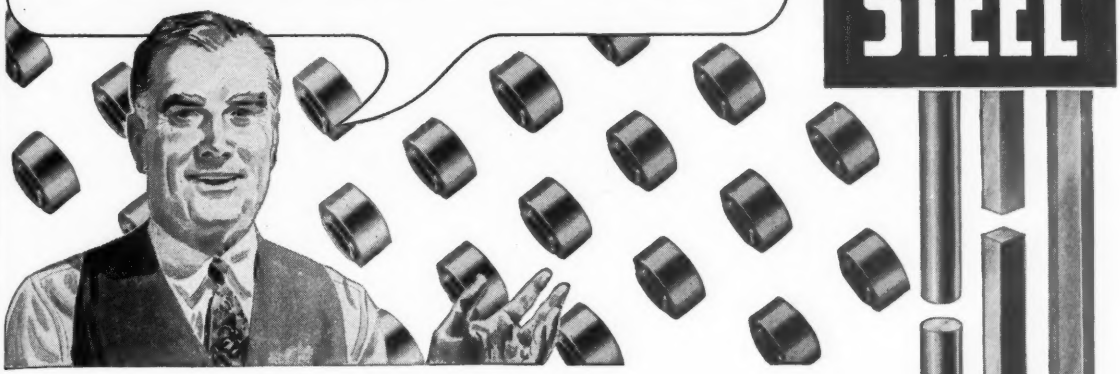
Story told by purchasing agents: Steel is getting so tight that you have to show your DO number to the gray market operators . . . Some 6500 will be employed eventually by the U. S. to man a Controlled Materials Plan; about 1100 are available to work on CMP now (p. 45) . . . Army ordnance will purchase 75,000 pounds of titanium metal products from Titanium Metals Corp. of America . . . The Air Force publicity men have instructions to give out no data on total AF purchasing; one reason: Total procurement information may blast prices upward; among other things, the prohibition reveals the Defense Department's confidence in ESA's ability to hold the price line.

What Industry Is Doing

Some 55,000 subcontracting and supplying chances have developed or soon will in the aircraft program (p. 43) . . . Iron and steel scrap yards are bare (p. 48) . . . The U. S. will aid machine tool builders (p. 48) . . . All military items will be free from the price freeze until Apr. 1 (p. 49) . . . Inventors are fighting government confiscation of their defense ideas (p. 50) . . . A union co-rule plan adopted in West German steel and coal industries is a big step toward socialism (p. 53), nearly as far-reaching as nationalization of British steel scheduled to take effect Feb. 15 . . . The rail strike dropped STEEL's production index 9 points to 211 (p. 61).

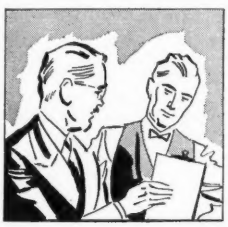
WE INCREASED PRODUCTION 71% WITH J&L "E" STEEL

J&L STEEL



(a story* about how to win customers and influence prospects)

"Got a minute? Well, let me tell you about what happened at our machine shop a couple of months ago when we first tried that new J&L "E" Steel. You wouldn't believe it was possible! (Confidentially, neither did we until we proved it to ourselves.) Here's what happened.



"We got an order to produce a big lot of plunger stops for solenoid starter switches. They're tricky to run, and you've got to be pretty careful every second. We'd read about "E" Steel in some of J&L's ads, and decided we might try some on this job.

"So we ordered some 17/32" E-33 "E" Steel stock, set up our B&S #2 and B&S #0 Automatics and began to turn out parts. We had used B-1113 for this job before and had been getting 350 pieces per hour. But we soon realized we could machine much faster with "E" Steel, and **we kept increasing speed until we were getting an average of 600 parts per hour. That's a 71% production increase!**

"Next thing we discovered was that our tools were lasting twice as long and the chips were coming off better with "E" Steel than they did with B-1113. We also found that the finish on the parts had improved from 20% to 25%.

"That's why we've been using "E" Steel. We turn out work much faster and can take on more jobs. Our men like the way "E" Steel machines and our customers get better parts and better service. Everybody benefits!"

Get your copy of the booklet titled "A Progress Report on 'E' Steel." It outlines a series of 11 case histories from machine shops that have used "E" Steel with excellent results. Write for your copy.

*Based on an actual case history.

"E" Steel (U.S. Pat. No. 2,484,231) is easily identified by the distinctive blue color on the end of every bar.

Jones & Laughlin Steel Corporation
404 Jones & Laughlin Building
Pittsburgh 30, Penna.

Please send me a free copy of "A Progress Report on 'E' Steel."

Name_____

Title_____

Company_____

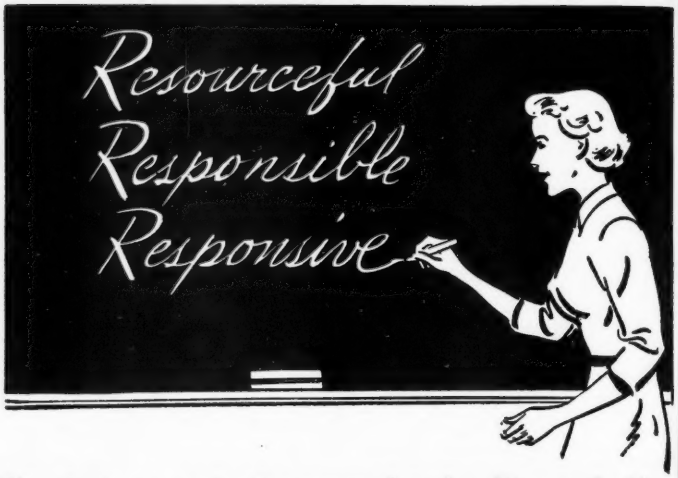
Address_____

JONES & LAUGHLIN STEEL CORPORATION

From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in OTISCOLOY *and* JALLOY (*hi-tensile steels*).

PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

The 3 R's of Reliance Service



RELIANCE *Job-Fitted* PRODUCTS AND SERVICES

COLD ROLLED STRIP STEEL

Coils . . . Cut Lengths . . . All Tempers
Slit, Sheared, Deburred
and Round Edge
From WAREHOUSE
or
DIRECT-FROM-MILL

SHEETS

Cold Rolled . . . Hot Rolled
Hot Rolled Pickled . . . Long Terne
Galvanized
Standard or production sizes
or cut to actual working
dimensions
from
WAREHOUSE STOCKS

Big plants . . ..extensive processing, handling and shipping facilities . . . a widespread organization — all these things help make Reliance Service *resourceful* and *responsible.*

But the things that make Reliance Service *responsive* are not measured by size or number. Over the years they reflect a concern's attitude toward its customers and their needs . . . a readiness to work closely with them . . . almost as an integral part of their business.

In our case they spell 28 years of day-in and day-out specialized experience, living with and licking sheet and strip steel problems . . . knowing the possibilities as well as the limitations of our products . . . knowing how they can best fit your jobs.

DEPENDABLE DAN
OUR CUSTOMERS' MAN

Reliance Job Fitting Service is a way of doing business that works for you . . . whether steel is plentiful or scarce, in peace time or in war (either cold or hot).

STEEL—BACKBONE OF AMERICA'S ARMAMENT

For Immediate Action Call The Nearest Reliance Plant or Office:

DETROIT STEEL CORPORATION

PRODUCERS OF
Coke and Coal Chemicals • Pig Iron • Ingots
Slabs • Sheet Bars • Billets • Wire Rods
Manufacturers' Wire • Merchant Wire Products
Welded Fabric • Cold Rolled Strip Steel

GENERAL OFFICES
DETROIT 9, MICHIGAN

RELIANCE STEEL DIVISION

Processors and Distributors JOB-FITTED Sheet and Strip Steel

GENERAL OFFICES — BOX 4308 — PORTER STATION, DETROIT 9, MICHIGAN

PLANTS

CLEVELAND PLANT, 3344 E. 80th St., VUlcan 3-3600, Cleveland 4, O.
DETROIT PLANT, 13770 Joy Road, WEbster 3-5866, Detroit 28, Mich.
EASTERN PLANT, State & Edmund Sts. (Hamden), New Haven 7-5781, New Haven 7, Conn.
MIDWEST PLANT, 1601 South Wolcott Ave., CAnal 6-2442, Chicago 8, Ill.

OFFICES

DETROIT 28, MICH., 13770 Joy Road, WEbster 3-5866
GRAND RAPIDS 2, MICH., 326 Keeler Bldg., GLendale 6-9569
INDIANAPOLIS 4, IND., 1408 Fletcher Trust Bldg., FRanklin 3429
JACKSON 18, MICH., 801 Reynolds Bldg., JAckson 3-3258
NEW YORK 19, N. Y., 250 West 57th St., COlumbus 5-4870
ST. LOUIS 8, MO., 4053 Lindell Blvd., LUcas 4558
TOLEDO 4, OHIO, 2114 Ohio Bldg., GArfield 8384
WORCESTER 8, MASS., 339 Main St., WOrcester 5-8686

COPYRIGHT 1951 D.S.C

A Great Asset

During the decade of the fifties there will be an opportunity to compare on a broader scale than heretofore the results of operating industry by private owners or by the state.

In the United States, Canada and a few other nations steel facilities are operated chiefly by private companies. In Russia and in most of her satellite nations steel properties are owned by the state. State-owned blast furnaces and steel plants are scattered throughout other countries in both hemispheres. Beginning on Thursday of this week about 55 per cent of Britain's iron and steel facilities, which has been privately owned, will pass into public ownership.

Thus for the first time the iron and steel industry of the United States and Canada will be pitted against foreign contemporaries which for the most part are under the direction of their governments. This competition comes at a time when demand for steel exceeds supply in almost every steelmaking area in the world. Therefore one of the first tests to be met by the privately and publicly owned steel companies will be ability to provide more capacity intelligently. That means arranging for expansion in the proper volume, in the right places and at the right times.

On this single test it is difficult to believe that the state-owned steel industries can even remotely approach the ability of the privately owned units. With few exceptions, experience has shown that private management is more intelligent in the use of stockholders' money than public officials are in the use of the people's money. In this country every privately owned public utility runs rings around its municipally owned competitor.

Already the private American steel companies are giving the world's state-owned steel units something to shoot at. Today our annual steel ingot capacity is 104,229,650 tons. By the end of 1952 it will be 117.5 million tons or more. It is doubtful whether any state-owned industry will match this percentage gain with new facilities of equal quality.

Private ownership is one of our greatest national assets—to be protected at any cost.

E. C. Shaner

EDITOR-IN-CHIEF

TIMELY SAVER OF TIN: Electrolytic tinplating saved substantial amounts of tin because it enabled tin plate manufacturers to apply thinner coatings than had been possible by the dipping process. Important additional savings now are in sight as the result of a new method perfected by Weirton Steel Co. by which the coatings on either side of the plate can be varied at will.

For instance, orthodox coating of 1¼ pounds

AS THE EDITOR VIEWS THE NEWS

per base box calls for the distribution of 1¼ pounds basis of tin on both sides of the plate. Under the Weirton technique one pound can be used on one side to protect the contents of the cans and a quarter pound on the other side to protect the exterior of the cans from exposure. The saving in pig tin is 50 per cent.

Weirton couldn't have picked a more auspicious time to introduce this process. It may enable the National Production Authority to modify its restrictions in the use of tin. —p. 48

* * *

GOVERNMENT FUTILITY: When you realize that the federal government has billions of your dollars to spend and much of it to waste, it is disconcerting to note how frequently it falls down on simple jobs. Friday night, Feb. 2, the Office of Price Stabilization had completed its iron and steel scrap price schedule. Government agency men, the press, scrap people and others wanted copies of the 43-page schedule immediately. The colossal government printing office said copies could not be gotten out until Tuesday, Feb. 6. Sensing the predicament, Edwin C. Barringer, Institute of Scrap Iron & Steel, obtained a copy from the board and worked his mimeographing staff all night to produce 1000 copies Saturday morning to supply the needs of government, press and industry.

The government could farm out to private industry much of the work it does inefficiently and it would be done at less cost, more speedily and accurately and the private contractors would pay taxes on their profits. —p. 50

* * *

CHRONIC INEPTITUDE: Charles E. Wilson was the logical man to speak out last Monday night in an appeal to the "sick" railroad switchmen to go back to their jobs. President Truman couldn't do it because he and his predecessor, President Roosevelt, had impaired the railroad labor act so that it was no longer workable. Secretary of Labor Tobin couldn't do it because he is too far committed to the idea that no union ever can be wrong.

Mr. Wilson could talk plainly because his job is to mobilize the nation for effective defense. He is not inhibited by political considerations. He knows that no matter how right the switchmen may be in their argument about wages, their absenteeism because of fake sickness is more damaging than anything Stalin has done or could do. The loss of productivity, time, life and money due to this "sick" stunt is appalling and it is due largely to chronic administration ineptitude. —pp. 50, 61, 117

* * *

HEADED FOR TROUBLE: Two moves toward socialism are noted in the news from Western Europe. The Labor government in Britain won out by a narrow majority of 10 in the vote on steel nationalization last Wednesday, which means 55 per cent of the British iron and steel industry will become publicly owned next Thursday.

In West Germany about 80 per cent of the major coal mines and steel plants are soon to go under union-management direction. Each mine or plant will be governed by a council or board of directors consisting of five members nominated by the unions, five by stockholders and an eleventh jointly. Another odd provision in the new set-up is that the unions have the right to name the company's "social" or personnel manager.

We wonder how these schemes will be working—say one or two years from now. —p. 53

* * *

THINK ABOUT REPAIRS: White Motor Co., Cleveland, has introduced a program of mobilizing its service and parts operations to keep trucks and busses made by the company running during the emergency. The idea is to catalog pertinent information on every White vehicle now in service and to integrate a central inventory control system with all branches, distributors, dealers and service stations.

Plans of similar nature might well be considered by builders of many kinds of industrial machines and equipment. We are approaching a time when it may be necessary to get along with old facilities because replacements will not be available. This means that it will be wise for both builders and operators to be thinking ahead now of the problems of repairs, parts and service which lie ahead. A little forehandedness today will save severe headaches tomorrow. —p. 90

THE ERIE DAILY TIMES
5 STAR FINAL
Mystery Cloaks Death
TRUMAN SAYS MAY CONTROL
WILSON TO HEAD WAR PRODUCTION; DEWEY ASKS TOTAL MOBILIZATION; HUGE RED FORCE NEARS BEACHHEAD
The New York Times.
Truman Maps Drastic Job Controls; Pay-Price Freeze Near, Wilson Says
Curbs on Hiring, Manpower Shifts Included in Plan
Red China Bars Cease-Fire; U.N. Unit Stabs Into Wonju
EISENHOWER HEADS WEST'S JOINT PRODUCTION BOARD
NEW RED BLOWS IN KOREA
PRESIDENT PROCLAIMS A NATIONAL EMERGENCY
AUTO PRICES ROLLED BACK
FULL JOB R
SET UP BY
VISIrecord

Results ...are always news

Headlining the trend to modern, time-saving, efficient records in these days of rapid conversion to defense production is *VISI*record—"The World's Fastest Visible Record Keeping System!" Engineered to occupy a minimum of space, to operate with a minimum of effort—but to give the maximum in management control—makes *VISI*record the finest, most modern record keeping system ever to be applied to American business.

Wherever efficient record control is a must—Production, Inventory, Stores, Accounts Receivable, Purchasing, Sales or Accounting—*VISI*record will provide you with the results for sound business operation.

Designed with all the compactness of a vertical card file but with all the advantages, time-saving and control factors "PLUS" of any visible record system, *VISI*record leads the way in efficient record management.

Finger-tip control of every record operation, desk level posting of hand written records, application to *all* business machines, ability to house money-saving multiple card records, trouble-free operation, unlimited card sizes to fit your record needs, low maintenance costs—are just a few of the many advantages of *VISI*record.

Models from small portable trays to single desk and multiple counterheight units enables *VISI*record to logically solve your every record housing need—most economically—with greatest operator efficiency.

You are guaranteed *results* with *VISI*record!

VISIrecord, Inc.

32-36 47th Avenue

Long Island City 1, N. Y.

Offices in principal cities throughout the world.

VISIrecord

S **VISIrecord, Inc.**
32-36 47th Avenue, Long Island City 1, N. Y.

Please send information on the following records_____

_____

_____

Please have representative call . . . . . ☐

Co. Name_____

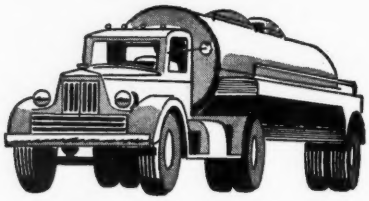
Address_____

City_____ State_____

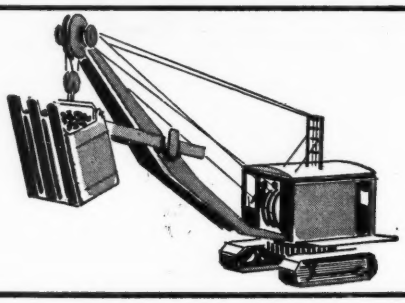
Signature_____ Title_____

make it
STRONGER

make it
LIGHTER



make it
LAST LONGER
with



INLAND

HI-STEEL®

HI-STEEL GOES FARTHER. With proper design, three tons will ordinarily produce the same number of units formerly requiring four tons of ordinary carbon steel.

HI-STEEL REDUCES DEADWEIGHT. Its high strength-to-weight ratio permits reduction of sectional thicknesses without corresponding decrease in strength.

HI-STEEL IS TOUGH. Nearly twice the yield point of structural grade carbon steel. Higher notch toughness, fatigue strength, abrasion resistance.

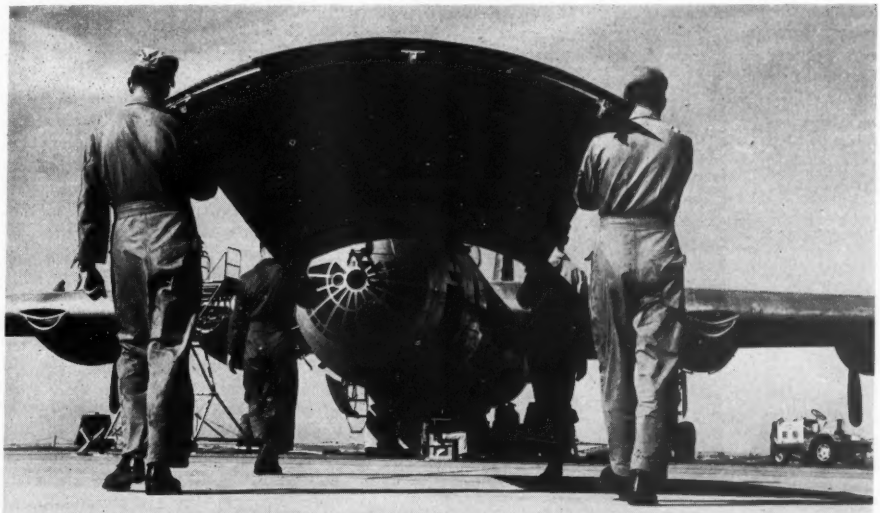
HI-STEEL IS DURABLE. Its tight scale resists atmospheric corrosion four to five times as long as ordinary structural grade carbon steel—and has been known to perform 12 times as long under abrasive conditions depending on the abrasive medium.

HI-STEEL IS EASY TO WORK. It can be fabricated hot or cold, punched or drawn, welded or riveted—with little or no change in standard shop practice.

INLAND STEEL COMPANY
38 S. Dearborn St. • Chicago 3, Ill.

SALES OFFICES: Chicago, Davenport, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.

PRINCIPAL PRODUCTS: Sheets • Strip • Tin Mill Products • Bar Mill Products • Plates • Structural Shapes • Floor Plate • Piling • Reinforcing Bars Rails and Track Accessories • Pig Iron • Coal Chemicals.



What's Your Part in Plane Building?

To deliver the thousands of planes the U.S. wants, the aircraft industry will become increasingly dependent upon perimeter plants—the auto producers, the tool and die shops, the metal fabricators whose products normally have nothing to do with airplanes. By late spring when the real flood of subcontracting begins, you may be as familiar with the Air Force symbol — the star and bars incorporated in the cover design—as with your own signature.

Some 55,000 subcontracting and supplying chances have developed or soon will develop as the U. S. gets set to spend $25 billion on military planes in the next 1 ½ years

OPPORTUNITY knocks 55,000 times in the defense aircraft program.

That's the estimated number of subcontracting and supplying chances offered in the expanding aircraft plan which will build up the nation's capacity to produce 50,000 planes a year. That potential will probably be achieved by mid-1953. Some of those 55,000 knocks have already been answered, but you will have time to respond to those still unsounded—if you hurry. The real flood of aircraft orders will start by late spring. Since last summer, ordering has been substantial, but in spurts and starts.

Triple Threats—Aircraft, which promises to be the biggest segment of the whole defense production program, can help you utilize fully your capacity in a controlled economy—if you win the race against time, your competitors and yourself. Wright-Patterson Air Force Base at Dayton, O., the center for aircraft buying information and procurement, had 80 appointments a day before the start of the Korean war with people interested in doing Air Force contracting. One day last month, 417 appointments were scheduled, and the average now is well over 200 daily.

You have yourself to contend with, too. Don't be content with just one subcontract or order for a material or component that eventually will be used in an airplane. An alert firm can land several. Big companies will be able to handle dozens.

Money's There—From $20 billion to $30 billion will be available for aircraft procurement between now and June 30, 1952. The Air Force is now spending at a rate of about $6 billion a year, far below actual appropriations. That may rise to a rate of $13 billion to $15 billion by the end of 1951.

Aircraft procurement appropriations already granted for the rest of fiscal 1951 in first and second supplemental appropriations total $6.6 billion for the Air Force and $3.4 billion for the Naval air arm. A third supplemental request is expected in March that will boost that $10 billion total. The budget for fiscal 1952 (which ends June 30, 1952) calls for $10 billion for Air Force procurement and $3.5 billion for Naval. Congress won't whittle much off those requests.

If We Have To—The money being requested is to build up the nation's capacity to 50,000 planes yearly. In a fractional war economy, we may not need to build that many. A good estimate is that we may have to climb to half that output or a little more to build up the Air Force. Once that's built, we can soar along by producing about 10,000 planes a year—if allout war is avoided.

Should we be forced to produce at the rate of 50,000 yearly, we wouldn't be able to reach that level until about July, 1953, Aircraft Industries Association estimates. Last year we produced about 3000 military aircraft. Based on World War II experience, production can be tripled in a year. Output last July was 215. Thus, by next July, we can turn out 645 planes, 1935 by July, 1952, and 5000 by July, 1953, when the 50,000 level would be finally achieved. Airframe weight production, a more accurate gage of aircraft production, triples in the same way (see chart on page 44). If 110 million pounds of airframe weight is produced in 1951, the output will still be a far cry from World War II years; 758.8 million pounds were turned out in 1943, 1101.0 million in 1944 and 599.6 million in 1945.

They Won't Talk—Air Force spokesmen won't say what kind of planes will be built if 10,000 are assembled a year. An estimate based on World War II experience and production since 1945 shows this possible breakdown: 40-45 per cent of the 10,000 will be day fighters; 10-15 per cent medium bombers; 10-15 per cent light bombers; 10-12 per cent carriers; 3-5 per cent heavy bombers; the remainder all-weather fighters, reconnaissance and miscellaneous type ships.

The Air Force now hints it's aiming for a 100-wing force, not 70;

("wing" is replacing "group" in flying jargon. A wing includes support units as well as actual aircraft. A group refers to aircraft only.) Under a 70-wing program, the Air Force would include four heavy bomber groups, 21 medium and light bomber groups, 22 day fighter groups, three all-weather fighter groups, six strategic reconnaissance groups, four tactical reconnaissance groups, ten troop carrier groups, plus 22 separate squadrons in support of the regular Air Force and 27 National Guard groups.

A Matter of Volume—Whether 10,000 or 50,000 planes are built a year, some 55,000 supplying opportunities are still available. The individual contracts will be larger in a 50,000-year than in a 10,000, but the number of contracts are expected to remain the same.

How can you get in on the aircraft program? If you're big enough, you may qualify in the Air Force's "Second Source Program." Under that plan alternate sources are set up for the product some prime contractor is making. The second source will be able to produce in case the first suffers some disaster or in case the first can't produce enough. Thus far, auto companies are the chief participants in the scheme. Fairchild Aircraft Corp.'s C-119 will also be produced by Kaiser-Frazer Corp. at Willow Run, Mich. Republic Aviation Corp.'s F-84F jet fighter will also be built by General Motors Corp. at Kansas City. Pratt & Whitney Division of United Aircraft Corp. will be paired off with Ford Motor Co. which will build the Wasp Major in Chicago.

What To Do—If you're a small or medium sized company, the best way to board the aviation bandwagon is to:

Canvass first your regular customers. It's possible they may already be in the aircraft program as prime contractors, alternate contractors or subcontractors. You may be able to supply components with a minimum of shifting of your own productive plant and distribution channels.

Inquire next among the prime contractors. There are probably less than 100. The Air Force and the Navy Bureau of Aeronautics have deliberately loaded up the major companies they did business with in World War II, many with a far greater volume than they can handle. That was done for speed and to avoid excessive renegotiation. The Air Force figures that those companies know the ropes on renegotiation and will know how to avoid it.

The Air Force also figures that the experienced prime contractors will know how and to whom to subcontract their excess orders.

Canvass next the subcontractors. There will probably be around 300, and many of them have already been lined up.

Make a careful check to see what you can make in electronic parts. In other areas of aircraft procurement, you may have to buck chains of contracting forged during the early 1940s. Not so in electronics, because much apparatus is used now that wasn't even in existence in World War II. Partly because of the complex electronic system, a plane today takes about four times as many man-hours to build as a comparable one ten years ago. The same reasoning holds for components of jet engines and helicopters. They both were in existence in World War II, but they've come a long way in the past five or six years. More than 500 helicopters were ordered by the military in 1950, a new high.

Avoid contacting directly the Air Force or Bureau of Aeronautics unless under unusual circumstances. Because of the highly complex nature of aircraft today, most of the prime contracts are pretty well earmarked almost as soon as the order is conceived. Alternate contracts are available through the Air Force, but almost all of them will go to big companies.

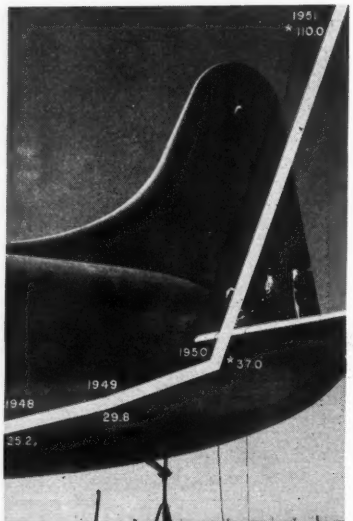
Keep informed on possibilities to subcontract for civilian aircraft, for some 190 civil transports probably will be built this year, compared with 75 in 1950. In touch with this phase of aviation procurement will be the Office of Aviation Defense Requirements at Civil Aeronautics Authority.

Plays the Field—The Air Force today has prime contracts with all the airframe producers, all the aircraft engine makers, all the propeller manufacturers. Major contracts are with Boeing Airplane Co. for B-47B, B-47C, B-50B bombers and the C-97 transport; Douglas Aircraft Co., C-124 and C-118B transports; Lockheed Aircraft Corp., F94C fighter, T-33 trainer and C-121C transport; North American Aviation Inc., F-86E fighter and T-28 trainer; Northrop Aircraft Inc., F-89 night fighter; Consolidated Vultee Aircraft Corp., B-36F bomber and T-29 trainer; Republic, F-84E fighter; and Fairchild, C-119B transport.

Major Air Force engine contracts are with Pratt & Whitney for the R-4360 and R-2800 piston engines and the J-48 jet; Allison Division of GM, J-33 and J-35 jets; General Electric Co., J-47 jet; and Curtiss-Wright Corp., R-1300 and R-3350 piston engines. The major propeller contracts go to Curtiss-Wright, Aeroproducts Division of GM and Hamilton Standard Division of United Aircraft.

Electronics—Major Air Force prime contractors in electronics are Sperry Corp., Lear Inc., Minneapolis-Honeywell Regulator Co., Bendix Aviation Corp., Hughes Aircraft Co., Radio Corp. of America, Philco Corp., West-

Military Air Frame Weight
(In Millions of Pounds)



*Estimated. Source: Aircraft Industries Association

Standard Air Armor Plate Around Pilot
230 Gallons Of Gas In Each Wing-Tip Tank
FS-424-A
Plane Carries 1800 Rounds Of Ammunition In Guns
Six 50-Calibre Machine Guns Four In Nose Of Fuselage---One In Each Wing
Up To 32 Five-Inch High Velocity Rockets Can Be Carried

Acme

KOREAN HOT SHOT: Carrying only a fraction of its 32-rocket capacity, Korea-based F-84 Thunderjets are shooting down Russian-built planes regularly. Built by Republic Aviation Corp., Farmingdale, N. Y., the fighter weighs 10,500 pounds empty, can be loaded up to 24,000 pounds. Total gasoline capacity has never been announced; wing-tip tanks provide a supplementary fuel supply

ern Electric Co., Emerson Electric Mfg. Co., General Mills Inc., Collins Radio Co., Raytheon Mfg. Co., Westinghouse Electric Corp. and GE. Other miscellaneous major contractors include AC Sparkplug of GM, Eastman Kodak Co. and A. O. Smith Corp.

Nine aircraft manufacturers are in the 1951 Navy program: Grumman Aircraft Engineering Corp., F-9F F-10F fighters and AF-2S, AF-2W antisubmarine planes; Douglas, F-3D fighter, AD-4, AD-4N, AD-4W and A-2D attack planes; R-6D and R-4D-1 transports; McDonnell Aircraft Corp., F-2H fighter; Lockheed, P2V-5, P2V-6 patrol planes, PO-2W radar warning plane, TO-2 jet fighter trainer, R70-1 transport; North American, AJ-1 attack bomber, F-2J fighter; Chance Vought Division of United Aircraft, F7U-3 fighter; Glenn L. Martin Co., P5M-1 flying boat and P4M-1 patrol plane; Consolidated Vultee Aircraft, R3Y-1 flying boat; Fairchild, R4Q transport.

Helicopters — Major producers of the Navy helicopters are Sikorsky Division of United Aircraft, Piasecki Helicopter Corp., and Bell Aircraft Corp., Electronic parts, propeller and engine producers are the same as for the Air Force. Westinghouse also builds the J-34 and J-46 jet engines for the Navy.

Once you get into the aircraft program, you can expect help from the newly formed Aircraft Production Resources Agency at Wright Field in Dayton. One of its major functions is to unravel production kinks arising from materials shortages and to prepare co-ordinated schedules for producing critical components and equipment.

Plants and Equipment—As an aircraft producer you may also get help for added plant and equipment. More than 1000 plants were built during World War II. Although many were sold to private industry, about 500 were kept under government control. Munitions Board plans to have 253 of those in reserve either on a standby basis or on the stipulation that they be kept in condition to convert to war production within 120 days.

A program to provide machine tools has proceeded on schedule. More than 161,100 general purpose machine tools now are in storage. Stockpiled critical goods may also help aircraft parts producers. An estimated $2 billion worth of critical materials were stockpiled as of late last year.

A metalworking company with no defense scheme may find itself permanently grounded. Participation in the aircraft program may be your opportunity to keep up sky-high production levels.

New Materials Control Plan Readied

Revised CMP to become effective July 1. It will guarantee priorities and guide production through control of steel, copper and aluminum. Claimant agencies map requirements

YOU can look toward a new Controlled Materials Plan to guarantee your priorities and guide your production after July 1. The National Production Authority is drafting a revision of the World War II plan to effect a balance between supply and demand for steel, copper and aluminum.

One effect of the CMP will be to bring the various parts of the defense program and the essential civilian programs into one unified effort. Control orders issued during the past several months have covered individual programs which now are threatening to compete with each other for the scarce materials.

How Much for Bobby Pins?—How the manufacturers of the less essential civilian goods will fare in obtaining scarce metals under the CMP remains to be seen. After the needs of direct defense and the directed civilian programs are filled, substantial tonnages of steel, copper, aluminum and other scarce metals will remain to be divided among civilian goods makers. How this is to be distributed is still to be solved.

NPA officials have decided to go ahead with CMP at the start of the second half because the DO-ratings system shows signs of breaking down. As defense requirements rise, these ratings tend to become only hunting licenses, as in the case of priorities in World War II. Already, some holders of DO ratings report difficulty in obtaining materials.

Some Suggested Lists—All claimant agencies of the government are instructed to prepare proposed program schedules and material needs by Mar. 1 for 1951 by quarters.

Twenty-three claimant agencies have received suggested lists of programs. For example, the Department of Defense will prepare programs on aircraft, guided missiles, ammunition, weapons, tank-automotive, transportation and railway equipment, ships, electronics and communications, clothing and equipage, building supplies and equipment, military construction and stockpiles. The program will list major items required in each quarter.

The claimant agencies also will report the requirements for steel, copper, and aluminum—by type, shape and form—for each quarter.

Supply vs. Demand — NPA will

WILL BE BUSIER: Additional numbers of these Scorpion F89 all-weather jet interceptors will be built under a new contract for the Air Force. This assembly line at the Northrop Aircraft plant at Hawthorne, Calif., will be even busier once manufacture is accelerated. The F-89 is a twin-jet counterpart of the Black Widow night fighter of World War II. It will carry elaborate radar equipment and heavy armament, enabling it to fly in darkness or bad weather

chart the available supply of steel, copper and aluminum by quarters. By comparing the demand for direct defense, essential civilian and less essential civilian goods against the supply, NPA will know where we stand in materials supply.

Where the demand exceeds the supply, limitation orders may be issued restricting the amount of less essential goods to be produced. For example, automobile production may be cut back to free steel, copper and other materials for more essential uses.

Meanwhile direct defense and essential civilian goods will get all the materials needed. CMP will set the precedence as to which orders are filled first.

They Like It Now — Many metalworking companies as well as producers of steel, copper and aluminum favor the establishment of a new controlled materials plan. They believe it worked well during the last war. Consumers with priorities like the plan because it makes their ratings effective and they are not compelled to spend a lot of time looking for a supplier who will fill their order. Producers like the plan because it keeps material-hungry customers off their necks.

Important differences will exist between the new CMP and that which started in 1943. Then practically all nonessential civilian production requiring steel, copper and aluminum was banned. Under the new setup, a large amount of material should be available for civilian goods after the military and favored civilian programs are supplied.

Metalworking executives foresee quite a scramble for this "free" steel, copper and aluminum unless some equitable plan for distributing it is devised.

Keys from Industry—To organize for the revised CMP, the NPA will have to be expanded. The Iron & Steel Division will increase its personnel from the 100 presently employed to between 300 and 350. Most newcomers will be recruited through civil service. Only key positions will be manned with industrial men. The blueprint calls for four more key posts in the division: 1. Director of ferroalloys; 2. director of raw materials and facilities; 3. director of production; and 4. director of programs and distribution.

The recruiting of manpower and the organization of the new CMP is a job so large that NPA officials think they'll have to work at top speed to get the plan ready to function by July 1.

"Rated" Burdens—In the meantime many metalworking companies will be hard pressed to obtain the materials they need to keep their facilities and work force employed. That's one of the big problems worrying NPA officials. The earlier plan of taking care of hardship cases on a voluntary basis has been running into difficulties as producers became more burdened with rated orders.

Relief for hardship cases may be attempted through a multiple-band priority rating system or through the issuance of DO ratings in hardship cases. There is no agreement that either of these would be effective.

NPA also is considering end-use limitations on steel and other strategic materials. Some NPA people believe a 25 per cent cut back in automobile production would release materials to take care of a lot of hardship cases. Such a move would, of course, be fought bitterly by the United Auto Workers unless the auto industry were granted sufficient defense orders to take up the slack.

In Bounds—Instructions issued last week to the government claimant agencies request the latter to give only their requirements for steel, copper and aluminum.

NPA believes controls over these three metals automatically should keep the demand for all other materials within bounds.

The claimant agencies include the Petroleum Administration for Defense, Defense Power Administration, Bureau of Mines, Solid Fuels Administration, Fisheries, Department of Agriculture, Defense Transportation Administration, Department of Defense, Army Engineers, Economic Cooperation Administration, Office of International Trade, Atomic Energy Commission, Maritime Administration, Civil Aeronautics Administration, Civil Aeronautics Board, Bureau of Public Roads, Federal Communications Commission, National Advisory Committee on Aeronautics, Federal Security Agency, Veterans Administration, Housing & Home Finance Agency, General Services Administration and Bureau of Industry Operations of the NPA.

The program schedules and material requirements list that they are preparing will cover the production of items on a list of "selected major items" drawn up by the NPA. They include several hundred items under the general classifications of electronics, photographic equipment, industrial and construction machinery, communications, transportation, containers, chemicals, power facilities and equipment, building materials and consumer goods.

Acme

MANLY FLEISCHMANN, National Production Administrator, orders controlled materials plan readied for operation July 1 to avert threatened breakdown in present priorities system

NPA Steel Officials Change

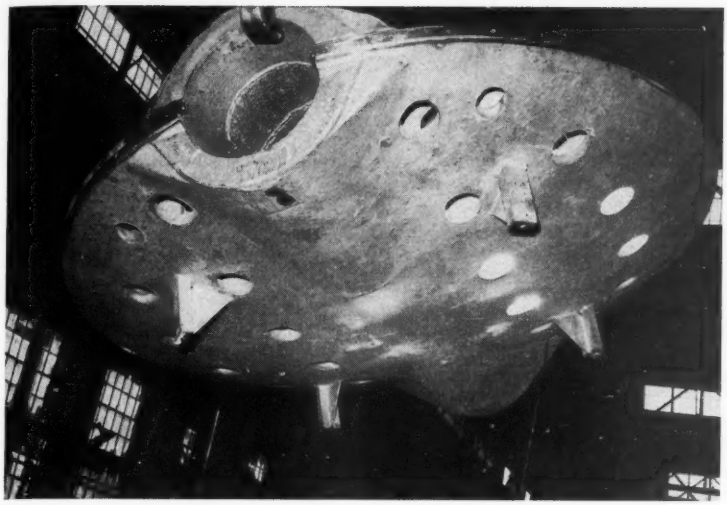
Under an agreement reached last fall with the Iron & Steel Products Industry Advisory Committee, a number of key men in the National Production Authority's Iron & Steel Division will return to their positions in the industry Feb. 28 and be succeeded by other men from the industry.

At that time David B. Carson will retire as director of the Iron & Steel Division and return to his job as vice president, Sharon Steel Corp. His successor as director of the division will be Melvin W. Cole, Bethlehem Steel Co., Detroit.

Others who will return to their regular positions in private industry are A. P. Happer, chief, Pipe & Tube Section; W. B. Quail, chief, Sheet & Strip Section; J. W. Robinson, chief, Bars & Semifinished Section; C. B. Boyne, chief, Stainless Steel Section; L. E. Creighton, chief, Alloy & Cold Drawn Bar Section; Arthur M. Long, chief, Tin Plate Section; W. E. Mullestein, chief, Plate Section; and William E. Bossert, assistant chief, Plate Section. Their successors, from the steel industry, have not yet been designated.

Thor Offers Packaging Space

A direct part in the defense effort will be given appliance distributors if a proposal of Thor Corp., Chicago, is accepted. The washing machine manufacturer, already cutting back on its production, feels the more than 3.5 million square feet of warehouse facilities operated by 77 distributors can be converted into



NOT A FLYING SAUCER: Although it looks like the Mars Express coming in for a landing with lights aglow and landing gear lowered, this is not a flying saucer, but a butterfly valve leaf. Weighing 27,000 pounds, the 120-inch bronze-rimmed cast steel leaf is being made by Westinghouse Electric Corp., Sunnyvale, Calif. It will control the flow of water through a waterwheel generator penstock at a Southern California hydroelectric project

packaging centers for the armed forces.

Under the proposal, Thor would act as a prime contractor on defense packaging projects. The distributors would be its subcontractors. Besides providing packaging centers in key industrial and transportation centers, the plan is expected to keep warehouse facilities at full capacity packaging food rations, medical kits, etc.

Heads Contract Seeking Office

The Greater Youngstown Area Foundation has named Paul F. Hrabko of that city to head a drive of smaller industrial concerns in Youngstown for a share of defense contracts. A group of fabricators employing from 1 to 300 persons organized the foundation's defense contracts committee.

Woodward Builds Coke Ovens

Thirty new coke ovens will be constructed at the Woodward (Birmingham) operations of Woodward Iron Co. Cost will be about $3.6 million. The program will enable the company to supply requirements of iron users throughout the southern industrial section.

This is the fourth coke oven battery announced in this district recently. Republic Steel Corp. is building 57 ovens at its Thomas (Birmingham) plant; Sloss-Sheffield Steel & Iron Co. is building 30 at Birmingham; and Alabama By-Products Corp. has 29 under construction at Tarrant, Ala.

Inland To Open New Ore Mine

A new iron ore mine near Crystal Falls, Mich., will be opened by Inland Steel Co., Chicago. Located on land leased from Jones & Laughlin Steel Corp., Pittsburgh, the mine will be placed in operation in late 1952. Development work will begin immediately. Expected production is 200,000 tons annually, says P. D. Block Jr., vice president in charge of raw materials.

More Titanium for National Lead

National Lead Co.'s Titanium Alloy Mfg. Division now controls the assets of the Hi-Alloy Castings and Tri-State Foundry Co. of Ellwood City, Pa. Titanium Division officials say added electric furnace capacity and power facilities at the Ellwood City plant will permit production of the various types of ferrotitanium alloys. The company hopes to augment production now underway at its Niagara Falls works.

Blooming Mill Goes to Austria

Lewis Foundry & Machine Division, Blaw-Knox Co., Pittsburgh, will build a two-high reversing blooming mill, including manipulators, tables and other accessories, for the Donawitz Steel Works of Alpine Montan Co., Austria. Amounting to over $1 million, the order was placed under ECA provisions.

Gold Needed for Steel

The steel industry spent $513 million last year, will spend a record $1.2 billion this year

ABOUT $1.7 billion will be the cost of expansion and improvement in the steel industry in 1950 and 1951, American Iron & Steel Institute says.

Iron and steel companies spent about $513 million last year; they'll spend $1.2 billion this year, a record sum that's 134 per cent higher than the amount allocated in 1950 and 307 per cent above 1941 expenditures. About 75 companies will expand finishing facilities; 35 to 40 will increase basic iron and steelmaking capacities. The ingot steel potential by the end of 1952 will be 117.5 million tons, compared with 104,229,650 tons a year now.

A Lot of Money — From 1946 through 1950, steel companies spent a total of $2.4 billion for new and improved facilities, equal to more than one-third of the total capital investment in steel at the end of 1949. In 1951 and 1952, more than $2.5 billion may be required to increase steel capacity to the anticipated level of 117.5 million tons. The billions spent and likely to be spent from 1946 through 1952 may be about equal to the total capital investment in the steel industry at the end of 1946.

From 1947 through 1949, the additions to steel capacity amounted to over 8,151,000 tons. Total expenditures on new plants and equipment were nearly $1.6 billion. From 1937 through 1941, when over 10 million tons were added to annual capacity, expenditures were slightly more than $1 billion.

Wants New England Face-Lifting

If New England is to retain its competitive position, it must undertake more plant renovation and expansion in 1951 than is now planned, says Walter H. Wheeler Jr., president of the New England Council. He pointed out that while the area did more than its expected share of war production in World War II, it was done with about one-half of the expected share of plant expansion.

Mr. Wheeler, president of Pitney-Bowes Inc., Stamford, Conn., advocates that New England industry take advantage of the accelerated amortization allowed by the government on defense facilities. An example, he says, is the New England steel mill at New London, negotiations for which are underway.

U.S. To Aid Tool Builders

Government will underwrite production pool. Priority aid will be extended

ORDERS for machine tools for defense and defense-support programs will be pooled with the government underwriting production schedules and governing distribution of the tools. Some 280 builders will receive orders over the next several months. Orders will be accompanied by DO ratings to enable builders to obtain materials and components for the tools.

Tools will be sold mainly to defense contractors and private industrial companies making essential civilian goods.

An order providing for pooled production of machine tools has been drafted and is being screened by the National Production Authority.

Ghosts Go West—A proposal to activate an across-the-board percentage of the phantom order program for machine tools will be abandoned. Some phases of the phantom order program will not be activated at all. In other cases, orders will be placed for double the quantities of tools provided in the ghost order program.

More Defense Ratings—Not only will DO ratings accompany the new pool orders, but the armed services will be asked to issue more defense ratings for orders which machine tool builders now have on their books. Builders complain they are unable to obtain steel, copper and components to cover production of urgently needed tools.

Easier Tin Restrictions?

They're made possible by Weirton electro-tinplating process that permits lighter tin coatings

WEIRTON Steel Co. has perfected an electro-tinplating process that will mean savings in pig tin and increases in the production of tin plate. The development may enable National Production Authority to modify its restrictions on the use of tin.

Electrolytic tin plate made with the new method is plated on one side with the amount of tin coating necessary to protect the contents of the tin can and on the other with only the amount needed to protect the outside from exposure. The industry practice has long been to put the same weight of tin coating on both sides of a sheet of tin plate. Weirton says no loss of quality results in using lighter coatings.

Tight Tin—Tin, which comes principally from the Far East, is already under rigid government controls. The tinplating industry has been cut back 20 per cent in the use of tin for the first quarter of 1951, and will be cut back 30 per cent of normal for the second quarter. NPA orders will curtail current tin consumption by about one-third. Weirton believes its process will enable Washington to revise tin production limitations.

Normally the tin plate used for some perishable foods bears a coating of 1¼ pounds basis of tin plate per base box, with distribution of 1¼ pounds basis of tin for the inside and outside of the cans. In that classification the electroplate will use one pound on one side and one-fourth pound on the other, a tin metal saving of 50 per cent. At the same time, the amount of tin plate surface it is possible to produce with the same quantity of tin is increased 100 per cent.

Big Savings—In the former one-half pound basis weights the savings are 25 per cent and the increase in area production 33.3 per cent. A former three-quarter pound basis weight shows a saving of 33.3 per cent and an increase in area of 50 per cent.

Weirton operates a tin mill at Weirton, W. Va., with a capacity of more than 22.5 million base boxes—or over 1 million tons—of tin mill products per year.

Tinless Tin Can Project Pushed

American Can Co. is pushing a project to make a tinless tin can.

This progress has been made thus far: In pilot-line operations cans made of tinless steel and low tin-bearing solder have been produced at speeds comparable to that at which tin plate cans are made; cans have been made with tin-free solders that give promise of adaptability to universal use; tin-free cans in which a plastic cement is used instead of solder for side-seams are now undergoing tests by several packers of oil and antifreeze.

American Can started its "Operation Survival" in 1946. The work has been intensified during the past several months.

Any Old Scrap for Sale? The Yards Are Bare

LOOK for further tightening in open market supplies of iron and steel scrap over coming weeks as result of the government rollback of prices and imposition of strict controls.

Scrap dealers, anticipating the Office of Price Stabilization action, worked feverishly the past several weeks to rid their yards of supplies at the higher prices then prevailing.

Movement of tonnage was hampered by the switchmen's strike, but most yards are reported pretty well cleared. As a result, supplies of purchased scrap will be limited for the next month or two.

All uncompleted contracts at the effective date of the price rollback, Feb. 7, take the lower ceiling prices.

New ceiling prices are accepted in good grace by dealers and brokers. Consumers appear satisfied.

Ceilings are based on a key price of $44 per gross ton, delivered Pittsburgh, for No. 1 heavy melting steel. This price, with the $1 broker's commission, brings the market back to a level only about $1.50 per ton under that prevailing early in January.

The controls follow in general the pattern established by the Office of Price Administration in World War II, including designation of consuming points as basing points and price differentials among the various bases and various grades. Three basing points are added to those in the old OPA schedule: Houston, Portland, Oreg., and Kansas City, Mo.

For the new list of government ceiling prices on scrap see page 126. Additional comment on scrap market conditions is on pages 132, 134, 136.

Steel Importers Squeezed

Caught in the narrow gap between base period price on steel as frozen and the high price of foreign steel are the steel importers, as represented by the newly formed American Institute for Imported Steel, New York.

Because its members operated on a small mark-up during the base period covered by the general price freezing regulation and because steel ordered far in advance is priced considerably higher than that available during the base period, the institute took its case to the Office of Price Stabilization. Institute representatives feel that relief will come as a regulation affecting not only steel, but other commodities. Relief will probably be a permitted markup over legitimate costs.

The institute was formed to distinguish the established merchants from the speculators who were selling imported steel at highly inflated prices. Headed by Nicholas Schilling of Amerlux Steel Products Corp., the organization represents Atlantic, Gulf and Pacific Coast firms that handle 95 per cent of imported steel.

Price Curb Exemptions

All military items are free from the freeze until Apr. 1; then exemptions will be more limited

THE COMMODITY or service you sell to the military is not subject to the general price ceiling regulation.

Economic Stabilization Agency's Supplementary Regulation No. 1 to the price freeze decree exempts all commodities and services peculiar to military needs until Apr. 1. Then the exemption will apply only to a limited group of commodities and services. But after Apr. 1, price adjustments will be permitted in "hardship cases" for sellers who have entered into contracts with the military services for items retained under ceilings.

Exempt — Specific exemptions in sales to a defense agency after Apr. 1 will include aircraft, ammunition, bombs and devices connected with bombs, fire control equipment, weapons, radar equipment, torpedoes, armored vehicles, automobiles, electronic devices, tools and many other items. Sales to a defense agency of these services will be exempt: Repair and maintenance of ships; experimental, development and research services etc.

Sales by the Atomic Energy Commission and purchases of strategic and critical materials for stockpiles are also especially exempt.

Special Case—Many commodities and services purchased by defense agencies are of a strictly military nature, and the imposition of price ceilings upon them is not practical or advisable because of frequent changes of specifications or production plans, or because of variations in the conditions under which contractors and subcontractors operate.

The government also figures it is protected because most defense contracts are subject to renegotiation.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to U. S. Commerce Department, Division of Printing Services, attention E. E. Vivian, Room 6225, Commerce Bldg. Washington 25. For ESA orders, write J. L. Miller, Economic Stabilization Agency, Room H367, Temporary E Bldg., Washington 25.

Materials Orders

RUBBER—Amendment 1 to Order M-2 reduces or eliminates use of natural rubber in certain products beginning Mar. 1.

ALUMINUM—Amendment 1 to NPA Order M-5 raises the ceiling on the number of defense orders aluminum producers and fabricators need accept in any one month. There is no change in the percentage of defense-rated (DO) orders distributors and jobbers must accept. The 60-day lead time provision of the previous order is continued.

ALUMINUM—Amendment 2 to NPA Order M-7 specifies more than 200 items (List A) in which aluminum cannot be used after Apr. 1, prohibits on and after Apr. 1 the use of more or better grade aluminum than is necessary for the functional operation of any item, and bars effective June 1 the use of aluminum in the manufacture of any item to be used solely for decorative or ornamental purposes. Items on List A may be completed if they were in the process of manufacture on or before Mar. 31 and completed by May 31. Items on the list which are completed by May 31 may be sold after that date.

COPPER & COPPER-BASE ALLOYS —Direction 1 to NPA Order M-12 permits producers and users of copper and copper-base alloys to readjust their base period use averages in cases where manufacturing or construction operations were shut down for more than 15 consecutive days during the first half of 1950. The direction also provides a formula for making the adjustments. Direction 1 to NPA Order M-12. Effective Feb. 1, 1951.

COPPER & COPPER-BASE ALLOYS —Amendment 2 to NPA Order M-16 allows miscellaneous producers of copper and copper-base alloys, such as foundries, chemical plants, iron foundries and aluminum foundries, to melt and process copper scrap generated in their own plants, and to accept from dealers the types of scrap specified in the order. Prior to the amendment, only copper refineries, ingot makers, copper wire mills or foundries were permitted to melt and process scrap arising from operations in their own plants. NPA Order M-16 as amended Jan. 31, 1951. Effective Jan. 31, 1951.

LEATHER—M-34 orders leather processors to cut to military specifications a certain number of pieces from each section of hide.

HIDES, KIPS, CALF SKINS—M-35 temporarily freezes the sales or delivery of them.

Price Regulations

DEFENSE NEEDS — Supplementary Regulation No. 1 to the General Ceiling Price Regulation of Jan. 26, 1951, exempts until Apr. 1, 1951, from the general regulation all sales to defense agencies or to suppliers with defense contracts or subcontracts of commodities or services for military use. After Apr. 1 the exemption applies only to a more limited group of commodities and services. Supplementary Regulation No. 1 (effective Feb. 1, 1951) to the General Ceiling Price Regulation of Jan. 26, 1951.

COAL—Supplementary Regulation No. 2 (effective Feb. 3, 1951) to the General Ceiling Price Regulation of Jan. 26, 1951, establishes an adjustment for retail solid fuel dealers to take account of recent mine price increases.

IRON & STEEL SCRAP—A Ceiling Price Regulation effective Feb. 7, 1951, places price ceilings on iron and steel scrap. The ceilings are based on a key price of $44 a gross ton, delivered Pittsburgh, for No. 1 heavy melting steel. The regulation lists 41 basing points and their base prices, differentials for various grades of scrap, switching charge deductions, and specifications of grades of scrap.

SUBJECT TO DELAY CLAUSE: Somewhere a construction or fabrication job will be delayed for the want of this structural steel, delayed by the railroad strike. Although many of the "sick" switchmen have "recovered," this plant of U. S. Steel Co. at South Chicago, and many others in the Middle West and East, saw steel shipments pile up and production facilities shut down

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

The National Inventors Council objects to the attorney general's belief that the U. S. should be permitted to confiscate inventors' ideas for defense

SHALL the government be permitted to confiscate the ideas developed by inventors to help the national defense program? Yes, says the attorney general. No, says the National Inventors Council.

The council is about to formulate a policy, for submission to Defense Mobilizer Charles E. Wilson, to protect an inventor's right under the patent system to bargain for compensation when his invention is used and to prevent pirating of his inventions by the government or any other agencies or individuals.

To a Boil—Thus will be brought to a head a tiff touched off by the attorney general in May, 1947, and again in December, 1950, when he held: "Where patentable inventions are made in the course of performing a government-financed contract for research and development, the public interest requires that all rights to such inventions be assigned to the government and not left to the private ownership of the contractor."

Assurance of fair treatment, the council feels, is necessary to encourage inventors to make their full contribution to the country's military might. Since Chairman Charles F. Kettering revitalized the council last year at the time our troops moved into Korea, the interest of inventors in helping the defense program has been multiplied by twelve. The council now is receiving ideas from inventors at the rate of 3000 a month. And the quality of these ideas is much higher than during World War II. It will be found, upon evaluation of these ideas, the council believes, that a superior performance is being staged by the country's inventors in the present emergency.

Defense Pushes Basic Research...

Continuance of the basic research work of the Army, Navy and Air Force is assured under a Research and Development Board ruling which establishes a minimum budget for such studies.

Under the formula, Department of Defense expenditures for basic research must be at least $30 million in the current fiscal year.

The basic research conducted by the armed services is aimed largely at filling in the gaps of the research program of private institutions.

In another action, the Research and Development Board has designated the National Research Council's Metallurgical Advisory Board as a clearing house for all government metallurgical information of interest to the armed services.

Mr. Wilson Holds the Edge . . .

Many Washington observers believed the question—Who will be top manpower man, Charles E. Wilson or Maurice J. Tobin—moved closer to solution when Mr. Wilson acted as the President's spokesman last Monday evening in a broadcast to impress railroad trainmen with the harmful effects of their wildcat strike.

If Mr. Wilson comes out on top, labor leaders will be disappointed. Labor leaders also would be disappointed should Economic Stabilizer Johnston refuse their demand that the Wage Stabilization Board be given the additional assignment of settling wage disputes; Mr. Johnston might give in on this point for he always has been sympathetic to labor leaders.

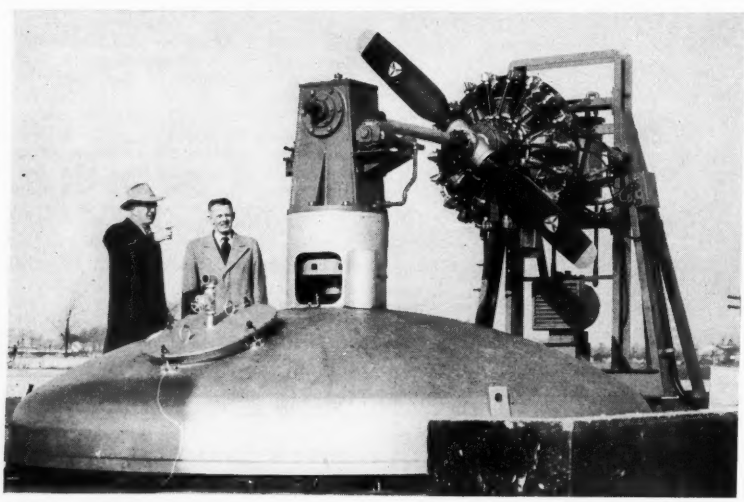
Best news of the week for labor leaders was the appointment of Albert J. Hayes, president, International Association of Machinists, as Special Assistant to Mrs. Anna M. Rosenberg, Assistant Secretary of Defense for Manpower and Personnel.

Scrap Institute to the Rescue . . .

An example of the service a trade association can render in the present defense emergency was afforded when the Office of Price Stabilization late Friday night, Feb. 2, completed screening its iron and steel scrap price schedule.

With hundreds of interested parties clamoring for copies, the best promise the board could get from the Government Printing Office was delivery the following Tuesday—not satisfactory in view of urgent practical needs. Ed Barringer of the Institute of Scrap Iron & Steel obtained a copy from the board, put on a night shift in his mimeographing department and early the next morning—Saturday—was ready with 1000 copies.

Thus, he supplied a copy of the 43-page document to his own institute, and such groups as the press and the NPA Scrap Iron & Steel section. The latter at once was able to prepare to allocate scrap Feb. 7, the effective date of the price schedule.



DOWN UNDER: Inspecting the first supersonic propeller "spin pit" at Aeroproducts Division, General Motors Corp., Dayton, O., are M. M. Monroe (left), general manager, and R. R. LaMotte, chief engineer. Designed to accomplish various mechanical tests upon supersonic propellers, the pit was developed under contract with the Navy's Bureau of Aeronautics and is part of a 100 per cent expansion of facilities program which will enable employment to reach 4000

Yes we build *Merchant Mills*

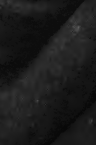
VER IRON & STEEL CO.	Pittsburgh, Pa.	1892
NES & LAUGHLINS, LTD.	Pittsburgh, Pa.	1893
TINA STANDARD I. & S. CO	Mingo Jct., Ohio	1895
ONES & LAUGHLINS, LTD.	Pittsburgh, Pa.	1898
ONES & LAUGHLINS, LTD	Pittsburgh, Pa.	1898
CARNEGIE STEEL CO.	Duquesne, Pa.	1900
CARNEGIE STEEL CO.	Duquesne, Pa.	1902
DEERING HARVESTER CO.	Chicago, Ill.	1903
RHEINISCHE STAHLWERKE	Meiderich, Germany	1904
LACKAWANNA STEEL CO.	Buffalo, N. Y.	1904
ATLANTA STEEL HOOP CO.*	Atlanta, Ga.	1905
GEORGS MARIEN BERGWERKS & H. V.	Osnabruck, Germany	1906
INTERNATIONAL HARVESTER CO.	Chicago, Ill.	1906
WHITEHEAD IRON & STEEL CO.*	Tredegar, England	1906
VER. KOENIGS & LAURAHUETTE, A. G.*	Koenigshuette, Germany	1907
INLAND STEEL CO.	Indiana Harbor, Ind.	1910
UPSON NUT COMPANY	Cleveland, Ohio	1910
LACKAWANNA STEEL CO.	Buffalo, N. Y.	1911
REPUBLIC IRON & STEEL CO.	Youngstown, Ohio	1912
PITTSBURGH CRUCIBLE STEEL CO.	Midland, Pa.	1915
YOUNGSTOWN SHEET & TUBE CO.	Youngstown, Ohio	1915
YOUNGSTOWN SHEET & TUBE CO.	Youngstown, Ohio	1915
UNITED ALLOY STEEL CORP.	Canton, Ohio	1915
BETHLEHEM STEEL CO.	Bethlehem, Pa.	1916
LACKAWANNA STEEL CO.	Buffalo, N. Y.	1916
JONES & LAUGHLIN STEEL CO.	Pittsburgh, Pa.	1917
TATA IRON & STEEL CO.	Sakchi, India	1919
ACIERIES DE FIRMINY	Dunkerque, France	1919
UNITED STEEL COMPANIES, LTD.	Sheffield, England	1919
INTERSTATE I. & S. CO.	Chicago, Ill.	1920
UNITED ALLOY STEEL CORP.	Canton, Ohio	1920
KANSAS CITY BOLT & NUT CO	Kansas City, Mo.	1922
INLAND STEEL COMPANY	Indiana Harbor, Ind.	1922
FORD MOTOR COMPANY	River Rouge, Mich.	1923
SOC. ANON. D'OUGREE-MARIHAYE****	Ougree, Belgium	1924
BETHLEHEM STEEL CO.	Johnstown, Pa.	1924
McKINNEY STEEL CO.	Cleveland, Ohio	1926
McKINNEY STEEL CO.	Cleveland, Ohio	1928
FORD MOTOR COMPANY****	River Rouge, Mich.	1928
YOUNGSTOWN SHEET & TUBE CO.*	Indiana Harbor, Ind.	1929
YOUNGSTOWN SHEET & TUBE CO.	Indiana Harbor, Ind.	1929
INTERSTATE IRON & STEEL CO.*	Chicago, Ill.	1930
WHITEHEAD IRON & STEEL CO.	Newport, England	1930
ILLINOIS STEEL COMPANY***	Chicago, Ill.	1932
JONES & LAUGHLIN STEEL CO.	Pittsburgh, Pa.	1932
WHITEHEAD IRON & STEEL CO.*	Newport, England	1936
BROKEN HILL PROPRIETARY CO., LTD.***	Newcastle, Australia	1937
GUEST, KEEN, NETTLEFOLDS, LTD.***	Cardiff, Wales	1938
AUSTRALIAN IRON & STEEL, LTD.****	Port Kembla, Australia	1941
NEW JARROW STEEL CO.***	Jarrow, Durham, England	1947
SHEFFIELD STEEL CORP.*	Houston, Texas	1945
ALUMINUM CO. OF AMERICA*	Massena, N. Y.	1946
BETHLEHEM STEEL CO.	Lackawanna, N. Y.	1947
SHEFFIELD STEEL CO.	Kansas City, Mo.	1948
ACINDAR INDUSTRIA ARGENTINA DE ACEROS S.A.*****	Argentina	1948
SHEFFIELD STEEL CORP.	Houston, Tex.	1948
DOMNARFVETS JERNVERK****	Domnarvet, Sweden	1949
LANCASHIRE STEEL CORP.*	Warrington, England	1950
ILVA ALTI FORNI e ACCIAIERIE d'ITALIA*	Bagnoli, Italy	
COLORADO FUEL & IRON CORP.***	Pueblo, Colo.	

*Mill also rolls rods
***Mill also rolls strip and skelp
****Mill also rolls rod and strip
*****Mill also rolls rod and skelp

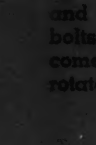
MORGAN CONSTRUCTION CO.
WORCESTER, MASSACHUSETTS
Rolling Mills - Morgoil Bearings - Wire Mills
Regenerative Furnace Control - Gas Producers - Air Ejectors
English Representative: International Construction Company
56 Kingsway, London, W.C. 2, England
RM-35

are You losing on this operation?

- You lose time—increase overhead costs—slow down production if you are not supplying your assembly line with Eaton Springtites* and Sems†.
- The old-fashioned method of assembly (separate bolt or screw and spring washer) requires the assembly line operator to use two hands and many additional motions.
- Eaton Springtites and Sems end this waste, changing it into profit.
- Our sales engineers will be pleased to recommend the right type of Eaton Springtites or Sems for use in your assemblies.



* EATON SPRINGTITES — quality Reliance Spring Lock Washers of correct size and type, pre-assembled on bolts or screws so they can't come off, yet are free to rotate and function properly.



† SEMS—same as Springtites but with various type multi-prong washers instead of spring lock washers.

EATON

EATON MANUFACTURING COMPANY

Springtites

EATON **RELIANCE DIVISION, MASSILLON, OHIO**

Sales Offices: New York, Cleveland, Detroit, Chicago, St. Louis, San Francisco,

West Germany Moves Closer to Socialism

The nation adopts union co-rule in the steel and coal industries. Personnel managers in individual companies will be labor men

THE WEST German government has just approved a program establishing union co-rule in the steel and coal industries.

Threats Win—By threatening a nationwide strike, powerful German trade unions pushed across their program in the German cabinet and legislature. Hans Boeckler, 75-year-old president of the unions is no ardent proponent of "co-determination," but he's forced to back the plan by strong left-wingers in the ranks. The program goes into effect in those steel and coal companies in a trusteeship under the Allied decartelization law No. 27. About 80 per cent of the major mines and steel plants are involved. Irony: The agreement is made possible partly because of the law No. 27, originally backed by the U. S.

Essential points in the agreement are:

Councils—Eleven-man councils or boards of directors are to be created at each plant or mine. Five members will be nominated by the unions, five by stockholders and the eleventh jointly. In case of a tie vote, the latter is to be selected by a special senate to be named by the federal government for each entire industry.

Representatives—In the case of the labor representatives on the council, two will be selected from workers at the site, two will represent the trade unions without regard to employment status, and the fifth will be a prominent man from public life. Four of the management representatives will be selected from among the stockholders, the fifth from public life.

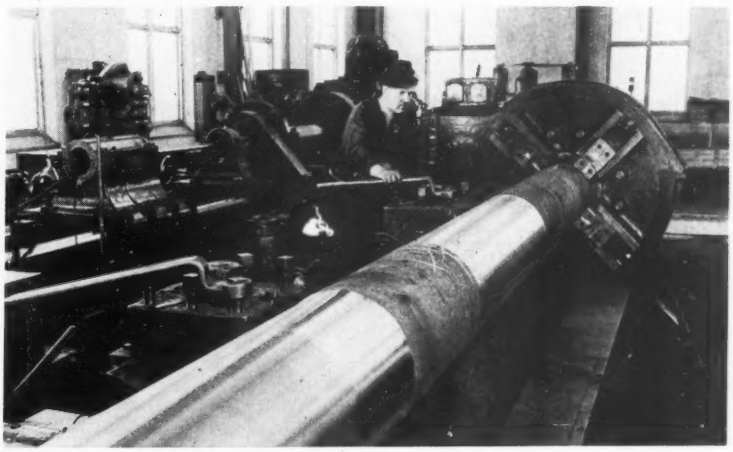
Senates—Provisions for the industry senates will be decided upon subsequently, but they probably will be modeled after traditional German economic chambers representing industry and labor.

Social Managers—One of the most far-reaching of the provisions in the agreement may be that the unions win the right to name the social manager or personnel manager in the companies involved. Communists are still numerous in West German unions and may get the personnel jobs. At least one already has—at the Huckingen steel plant near Duisburg.

With this success behind them, German unions are pushing to line up other industries, too. They have already made similar demands for chemical companies and banks and reportedly have the same scheme ready to spring on all general manufacturing firms.

U.S. Pipe Buys French Interest

Interest of Compaignie de Pont-a-Mousson, Nancy, France, in Pontusco Corp., owner of all the common stock of United Concrete Pipe Corp., is now owned by United States Pipe & Foundry Co., Los Angeles, formerly a joint owner. United States Pipe manufactures cast iron pressure pipe. It is completing a plant in Decoto, Calif.



TURNS THREE TURNS A DAY: Operating on three shifts per day is this lathe, in operation at the machine shop of Akers Styckebruk Aktiebolaget, Styckebruk, Sweden. Made by Mackintosh-Hemphill Co., Pittsburgh, the 44-inch screw feed lathe works at speeds up to 39 rpm for rough turning. When turning roll necks for roller bearing mountings, it meets tolerance specifications of about 5/100-millimeter (about 0.0019-inch)

A Way To Save Alloys: Use Boron-Treated Steels

In the interests of alloy conservation, users of steel for quenched and drawn parts inevitably will have to turn to boron-treated carbon steels, thinks Walter E. Jominy, staff engineer, Chrysler Corp., Detroit, who addressed the Cleveland Chapter, American Society for Metals.

Speaking on alloy steels from the viewpoint of the consumer, he said that specifying constructional steels by minimum hardenability instead of by chemistry is a definite trend of the moment and will expand as alloys become more critically short. Available commercially now are about 70 of the so-called "H" steels for which hardenability bands are specified.

In discussing depth of hardening on heat treated automotive parts, Jominy said he believed hardness penetration to one-fourth the radius of a round part was ample, and that 90 per cent martensite requirement in the hardened area was a reasonable goal. Hardening all the way through a cross-section increases the tendency to distortion and cracking.

He reviewed tests made on a wide assortment of automotive axle shafts, principally of steels in the 1300, 4000 and 5100 series, and with only one exception hardness did not go beyond one-quarter of the distance from the surface to center. The exception was three-eighths of this distance.

Cabinetmakers To Hear Hamaker

L. S. Hamaker, assistant general sales manager, Republic Steel Corp., will speak at the annual meeting of the Steel Kitchen Cabinet Institute, in Cleveland, Feb. 14.

His subject will be "Problems Facing the Steel Fabricator." Fol-

lowing the luncheon meeting, representatives from the industry will take part in a round-table discussion of problems and developments in the cabinet-making field.

Personnel Snags To Get Airing

Wage stabilization, approached from points of view of management and labor, will get a going-over at the personnel conference of the American Management Association, Feb. 26-28 at the Palmer House, Chicago. In other sessions, government and industry speakers will discuss emergency manpower problems. Some questions on the agenda: What preparations will be necessary to obtain wage and salary adjustments under controls? What probably will be the substitute for the Little Steel Formula? What should be done about "Escalator and Improvement Factor" clauses? How will stabilization affect collective bargaining?

Extruders Cry 'Ouch'

Small aluminum extruders detail their troubles in a brief before Small Business Committee

SMALL OUTFITS making extruded forms and products are in a tight squeeze. The pressure on them has been increasing since enactment of the Defense Production Act of 1950 and subsequent NPA materials orders. A brief filed by the Aluminum Extruders Council of Boston with the House Select Committee on Small Business details the forces that it says are working the little fellows over.

This is the way the council feels about the matter: Even though various sections of the defense act provide for equitable distribution of rated orders and available aluminum and specifically mention the encouragement of small business, discrimination exists. The council says no representatives of the companies it serves have been given an opportunity to be invited for consultations or given any facts or figures that might assist in promulgating NPA aluminum material orders.

Under Control—The M-7 order on aluminum is also in for criticism. The council says, for all intents and purposes, prime producers are excluded from its provisions. Section 26.24 says the order does not apply to those who produce or convert aluminum or who use it in the production of other metals. The council, composed of about 85 per cent of the firms in the U. S. with about 30 per cent of the country's extrusion presses, thinks M-7 was written for the exclusive control of the "little fellow."

Many independent extruders have failed to receive their aluminum billets from scrap deposited with the "preferred list" of those qualified for conversion. Not only is a source of aluminum being taken away, but use of conversion equipment in extruders' shops is prohibited. An attempt to obtain permission for unrestricted use of imported aluminum has failed; no action has been taken on the subject.

The brief also mentions another case of alleged discrimination: Last summer one of the prime producers increased the price of billets (virgin aluminum, used by extruders) and reduced the price of extrusions.

Bright Spots—The only refreshing element, says the council, is the attitude of the Air Force and Navy. They have indicated the importance of keeping the presses of the independent extruder operating so they may be available for immediate conversion to defense production.

Because the limitation orders of the NPA have little or no affect upon the prime producers of aluminum, the council is urging that a full investigation of the aluminum industry be instituted and that its administration by the NPA also be reviewed. It states that any theoretical gap in civilian production for the producers has been more than closed by the defense orders they possess.

STAMPING THROUGH THE PLANT: Among those witnessing the various operations of Leake Stamping Co., Monroe, Mich., at its open house are Mr. and Mrs. William Baumheckle. He is vice president and director of the company. They are watching one of several large presses stamp stone deflectors for use on Kaiser automobiles. The company, now in its 14th year, has 200 employees and has expanded five times since its founding. Heat treating, joining, testing and painting facilities supplement the stamping equipment

Ohio Firms Plan Contract Talks

Ohio manufacturers interested in getting into defense work will meet at Masonic Auditorium in Cleveland Feb. 20. The conference will provide opportunity for firms to register machine, manpower and open capacities with procurement officers. The talks should reduce confusion on procedure, says Clay H. Hollister, of Case Institute of Technology, and conference chairman.

C. F. & I. Buys Worth Steel

Colorado Fuel & Iron Corp. is extending its operations to the Eastern Seaboard and diversifying its line of steel products by contracting to purchase Worth Steel Co., Claymont, Del. Purchase is scheduled to be consummated Mar. 5.

C. F. & I. now operates integrated steel plants in Pueblo, Colo., and Buffalo, and with its subsidiaries has six steel manufacturing plants in Massachusetts, Pennsylvania and California. C. F. & I. will operate the Worth plant as a subsidiary under the name of Claymont Steel Corp., and will continue to produce Worth's line of products, which primarily are steel plate for the ship, tank and heavy boiler trades and transmission pipe for the oil and gas industries.

The Worth plant, located on a 650-

acre tract along the Delaware river, has an annual ingot producing capacity of 468,000 net tons. C. F. & I. is investigating possibilities of expanding the Claymont operations to take maximum advantage of the strategic tidewater location.

C. F. & I. is the nation's tenth largest steel company and produces principally wire, rails and structural steel.

Still a Shortage

Despite record ferrous production, the NPA is hearing the cry of shortage from many sources

THE CRY of "shortage" still arises from iron consumers despite record iron production.

Among those voicing plaints are the cast iron boiler and radiator makers. Their industry advisory committee felt it necessary to meet with National Production Authority officials to insure a flow of materials.

Production of boilers and radiators has expanded to the point where demand for foundry iron exceeds the available supply of it. The industry representatives also reported that steel for radiator jackets is difficult to obtain.

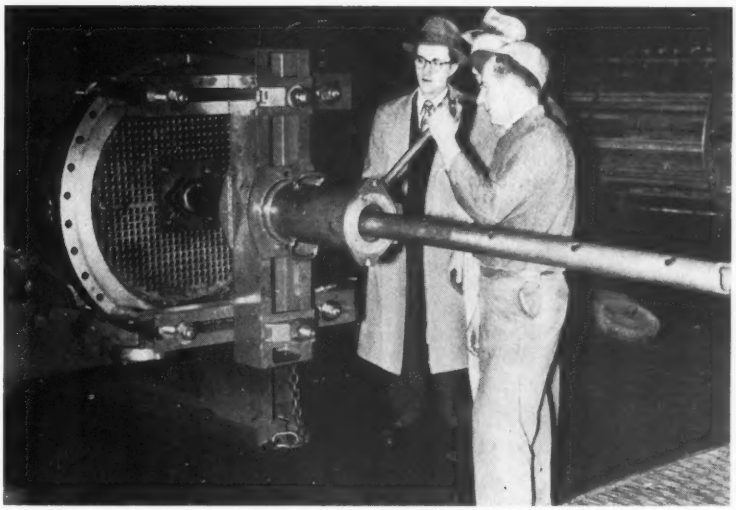
Figures released by the American Iron & Steel Institute show that iron consumers outside the steel industry got 1.3 million tons more iron in 1950 than in 1949. These 1950 shipments totaled 5,692,000 tons.

Help Wanted—Helping make possible the increased shipments of iron to users outside the steel industry was the record production of 64,589,140 tons of iron in 1950. That was an increase of more than 11 million tons over 1949.

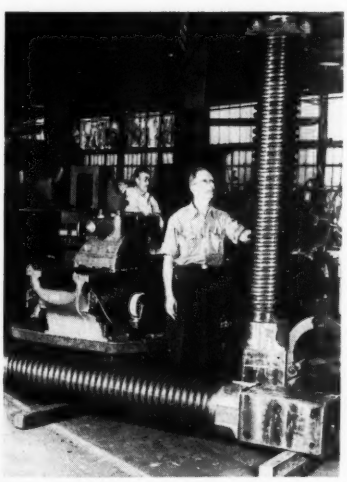
Also putting the "bite" on the NPA for materials is the hack saw and metal cutting band saw industry. To keep defense and essential civilian industries operating, it is requesting more high speed and alloy tool steel. Molybdenum and tungsten alloy supplies are not large enough to reduce the growing order backlog.

A Way Out—The shift from tungsten to molybdenum and reserving of half of the molybdenum for tool steels will help. The NPA revealed that molybdenum probably will be allocated in a manner similar to tungsten.

The saw industry used about 5000 tons of steel in 1949, 6000 in 1950 and estimates its consumption at 8000 tons in 1951. The amounts are about evenly divided between band saw and hack saw blade producers, the former using tool steel alloys, the latter high-speed steels.



BETTER RATE OF EXCHANGE: Lower initial investment for supporting structures in processing plants will result from a new method of removing heat exchanger bundles. Developed by M. W. Kellogg Co., Jersey City, N. J., the method makes use of a special jack of the type shown. The remover, itself a portable modified commercial center-hole hydraulic puller, permits a more compact general plant layout and lighter exchanger supports. Device can exert a push on the tube bundle up to 12,000 pounds for a maximum distance of 16 feet



GOT A SCREWDRIVER?: Measuring 12 inches in diameter and 8 feet 9½ inches long, these 3200-pound housing screws were machined to a tolerance of plus or minus 0.005-inch. Made for adjusting the forming rolls of steel rolling mills at the Fontana, Calif., plant of Kaiser Steel Corp., the screws were made of electric furnace steel by National Supply Co., Torrance, Calif. Bronze nuts, weighing 2400 pounds and having an inside thread with a 2-inch pitch, will be used on the screws. All forging, heat treating and machining on the screws was done at National Supply. A special fixture for flame hardening the threads was built for this job

Granite City Buys Pig Iron Plant

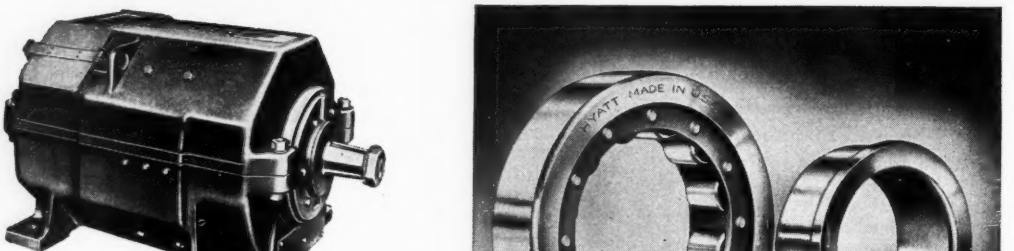
The Koppers Co. pig iron plant at Granite City, Ill., was purchased by Granite City Steel Co. Facilities consist of one 600-ton and one 500-ton blast furnace, a 49-oven coke plant and other producing equipment.

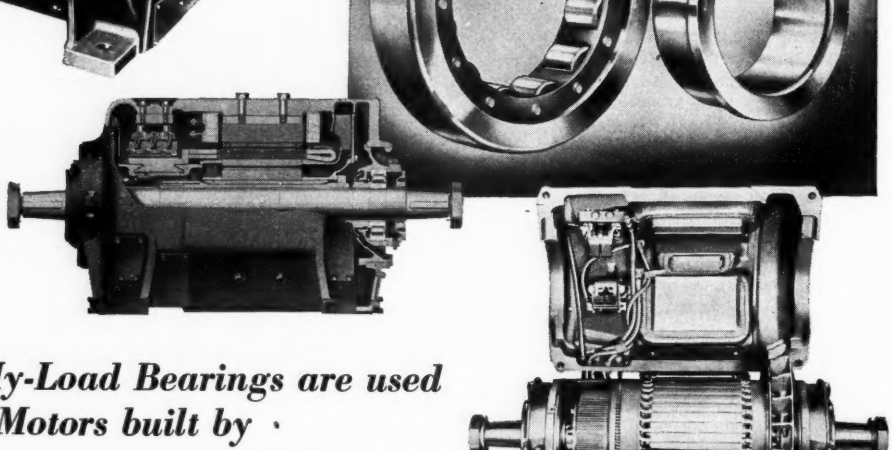
The plant, capable of producing 1000 tons of pig iron per day, was acquired from the War Assets Administration three years ago; it has been modernized by Koppers during its ownership.

Rheem Co. Enters Supplier Race

Rheem Mfg. Co. will construct a 200,000-square foot addition to its South Gate, Los Angeles, plant and is seeking subcontracts from several major West Coast airplane manufacturers. In World War II, the company was a subcontractor for Lockheed, Consolidated Vultee, Northrop, Bendix and Ryan. Laurance H. Cooper, former president and general manager of Pacific Airmotive Corp. and wartime manager of the Consolidated Vultee plant at Elizabeth City, N. C., will head Rheem's new aircraft department.

HYATT Protection for your Mill Motors





Hyatt Hy-Load Bearings are used in Mill Motors built by

Elliott Crocker-Wheeler
General Electric
Westinghouse

Hyatt Hy-Load Roller Bearings are just what the name implies . . . high capacity radial type bearings built for heavy service, long life and freedom from wear and care.

Assembly and disassembly is easy with Hyatt Hy-Load Roller Bearings. Separable construction with flanged races keeps lateral play within prescribed limits yet allows the armature to center itself electrically.

To be sure you get all these Hyatt advantages specify Hyatts by name on all new mill motor purchases. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

By H. C. TUTTLE *Detroit Editor, STEEL*

Mirrors of Motordom

Chrysler and General Motors battle over relative merits of high-compression engines. New V-8 develops 180 bhp, more than any other current passenger car unit

DETROIT

ONE of the hottest fights in automotive history is the battle now waged between Chrysler Corp. and General Motors over relative merits of their high-compression engines. Chrysler contends (without mentioning names) it has a substantial edge over the competition because it has approached the high-compression problem from an engineering standpoint; that its engine boasts "mechanical octanes" which will always give an edge regardless of the direction of gasoline octane ratings.

The Chrysler V-8 has several distinctions: Rated at 180 bhp, it produces more power than any other current passenger car engine; it develops more power for its piston displacement; it contains a hemispherical combustion chamber previously found only in racing car and aircraft engines and in some low-production European power plants. High power output is due principally to three factors—shape of the combustion chamber, lateral arrangement of valves, 90-degree "V" cylinder setup with short stroke and large bore.

For the hemispherical combustion chamber, Chrysler engineers list these advantages: High volumetric efficiency; high thermal efficiency and low specific heat rejection; exceptional combustion characteristics; excellent adaptability to higher compression ratios; and greater valve durability.

Breathes Easily — Bringing these points down to more easily understood terms, volumetric efficiency is a measure of the engine's breathing capacity. In the chamber and valve design stress was placed on achieving minimum resistance to air and fuel flow, both on intake and exhaust. Valves are above average diameter and have high lift, with intake and exhaust manifolds arranged to minimize restrictions. The intake manifold is divided into two sections, each of which feeds the two center cylinders in one bank and the two outer cylinders in the other bank. Each branch of these sections is approximately the same length to insure distribution of the air-fuel mixture in the same quantity and in the same length of time. Furthermore, the branches are correlated to the firing order of the cylinders to permit successive firing cylinders to draw the mixture through opposite risers and preclude "intake interference."

Thermal efficiency is the measure of an engine's ability to utilize heat energy in the fuel. To attain greater heat utilization by means other than high compression, three factors —combustion chamber heat loss, incomplete fuel combustion and time required for combustion—are carefully controlled. The dome-shaped combustion chamber reduces the surface area through which heat can be lost. Heat loss through the walls of the exhaust ports is also minimized by low restrictive characteristics at the valves. Lower heat transfer to cooling water permits an 18 per cent reduction in radiator core area from last year's plus a reduction in fan diameter, number of blades and speed.

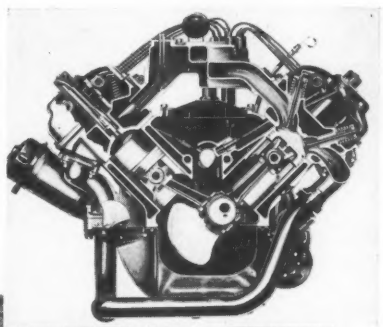
The widely separated valves make possible the positioning of the spark plug near the center of the dome which permits short flame travel for complete combustion and also decreases the likelihood of pre-ignition and hot spots. Deposits which form on the chamber are thin and evenly distributed. Detonation-free performance is possible with regular grades of gas.

As higher compressions are made possible through increasing octane ratings of gasoline this engine's design will be modified only slightly. Valves can be made larger, and the domed construction of the chamber is inherently strong enough for higher compressions.

Valve durability is enhanced by the design of the cooling water passages. Lower valve operating temperatures and decrease in the possibility of valve seat distortion, it is claimed, will add life to the valves.

Weight per HP Down 30%—Increased rigidity of the V-8 design is accompanied by a significant reduction in weight. From fan to crankcase flange at the rear the engine measures 9¼ inches less than the 1950 product. Width is increased 6⅞ inches but this increase occurs at the top so no increase in frame width is required, only a minor revision in fender shield design being necessary to house the engine. Height is the same. Total weight of the power plant assembly including transmission is 923 pounds compared with 1002 pounds in last year's design. Weight of the engine per horsepower is reduced to 5.13 pounds from 7.42.

From a fuel consumption standpoint, average improvement over last



ANOTHER HARDTOP: This Chrysler New Yorker Newport is one of 21 body styles on the line's 1951 models. Beneath its broad sloping hood is the new 180-hp V-8 FirePower engine, the most powerful in the automobile field (see STEEL, Jan. 22, p. 57, Jan. 29, p.44). A cross section of this engine is shown at right. The styling is also available on Windsors and Imperials

(Material in this department is protected by copyright and its use in any form without permission is prohibited)

year's design is approximately 10 per cent. Horsepower, of course, is 33 per cent higher. In dynamometer tests through the normal operating speed range of the two engines the new design gave better fuel economy ranging from 2 to 27 per cent.

Devising a method to actuate the valves was one of the knottiest problems encountered in the engine's design. The lateral arrangement, with widely separated valves, accounts for the difficulty. As finally engineered, the pushrods and rocker arms operate on twin rocker shafts, the arms facing in opposite directions.

A single carburetor with dual throats is used. The throttle body is water heated to prevent carburetor icing. The automatic choke features a heat-retaining plate which makes possible use of a more active thermostatic coil and also stores heat to enable the choke to cool down uniformly after a hot run.

Belt in the Back—Styling changes in the 1951 Chryslers include a sloping hood for better visibility, new front fenders, new front and rear fender moldings and a belt molding that encircles the car. A "wrap-around" rear window increases the glass area in the back by 30 per cent. Differences in the grilles distinguish between each model in the line.

Appearing rather hum-drum alongside of its passenger-car cousin, the new Dodge truck, nevertheless, is worthy of inspection. Incorporating 50 refinements, the trucks feature increased power, better brakes, improved steering, better shock absorbers and more driver comfort. The line is powered by eight different engines, horsepower of which has been stepped up as much as 20 per cent through use of twin carburetion and twin exhaust.

Styling feature is a new two-louver grille mounting a center medallion. Paint and baked enamel is used on grille members and bumpers.

Pass the Aspirin

The state of mind of the automobile industry in the month of February is described in the phrase, "bewitched, bothered and bewildered." Never before has it caught so much from so many directions in such a short time. Weather, labor, taxes, materials, prices—given the opportunity, there isn't an executive, in the industry who couldn't write a full-fledged damnation of each.

The materials supply situation is the most worrisome of the lot, being of longer-term concern. Last week's headache included the railroad switchmen's strike which idled in excess of 100,000 in the industry.

Auto, Truck Output

U. S. and Canada

	1951	1950
January	650,545*	609,878
February	.....	505,593
March	.....	610,680
April	.....	585,705
May	.....	732,161
June	.....	897,853
July	.....	746,801
August	.....	842,335
September	.....	760,838
October	.....	795,947
November	.....	633,678
December	.....	671,284

Weekly Estimates

Week Ended	1951	1950
Jan. 13	139,679	154,552
Jan. 20	162,485	158,432
Jan. 27	167,809	141,036
Feb. 3	152,721	127,428
Feb. 10	140,000	125,737

Estimates by Ward's Automotive Reports

* Preliminary.

GM was hardest hit with 52,000 idle in 12 plants and 30,000 in nine plants working only part-time. Ford had seven plants down. Nash had closed down its Milwaukee and Kenosha plants. Many other companies were on a day-to-day basis, and will spend weeks trying to build up floats of materials and components.

Kaiser-Frazer, after a 15-day strike brought on by disciplining a worker for fighting with a foreman, was resuming operations. It agreed to submit the union's case against the foreman to arbitration; the union accepted a two-week layoff for the worker.

From an economic standpoint it looked as though the industry's troubles were just beginning. Lacking clarification beyond the broad terms of the price freeze order, used car dealers were screaming that they cannot operate under that kind of a freeze. It's one thing, they say, to set a price on a standard item that is sold every day across the counter. It's an entirely different thing to peg the price of a used car when mileage, physical condition, etc., can be so different. Furthermore, the freeze caught most products at the highest level in history, while used cars are far depressed by the season and by the effects of Regulation W.

Treasury Secretary Snyder's tax proposal was another Sunday punch. Recommending an increase in the manufacturers' excise tax on new cars from 7 to 20 per cent, his suggestion has aroused the ire of labor and management. Union contention has been that Regulation W's stringent terms have already written cars off the average wage earner. Guessing in Detroit last week was that this higher excise tax would be too much for anyone to swallow. Immediate reaction by the public to the proposal was a rush to buy cars, although no one seriously believes such a stringent tax impost would ever get the green light.

"Super 88" Called Back

The "Super 88" body which was to have appeared in the new Oldsmobile lineup (STEEL, Feb. 5, p. 61), was called back from production too late to keep it a secret. In General Motors ads in consumers' magazines the Super 88 appears. It is also being exhibited in the General Motors building in Detroit. Public introduction, however, will not be made until next month when, incidentally, the present price freeze on new automobiles will have thawed.

New Diesels in the Works

Broad-scale diesel engine development program is under way at the Cleveland Diesel Division of General Motors, in co-operation with the Navy's Bureau of Ships. Involved is a completely new design of engine, presumably for powering submarines, requiring extensive engineering work, new tooling, increased employment and the like. Division spokesmen will say nothing about the activity, claiming they are tightly muzzled by the Navy.

Cleveland Diesel, outgrowth of the old Winton Engine plant, was a beehive of manufacturing during the last war, when two plants were operated to turn out large diesel power plants for naval installations. At the termination of hostilities, business skidded. Electromotive Division took over one of the plants, and large numbers of personnel either resigned or were released. In some quarters there is the hunch expressed that GM top management would like to see Cleveland Diesel a little less closely tied to production of navy engines and more spread out into commercial fields, at least for the long range.

In recent years, the division has had under development at least two new types of diesels, one a vertical crankshaft design with no camshaft, injectors being fired by cylinder pressure; the other a closed cycle arrangement for submarine installation, in which no outside air is required for operation. It is possible the present resurgence of production planning is tied to these innovations.

Freedom from Care

WITH NEW DEPARTURE BEARINGS

The concept of
cutting maintenance
and increasing life
in mechanisms
by new bearing design
originated with
New Departure

The lubricated-for-life
ball bearing. Ask for it.

Nothing Rolls Like a Ball...

NEW DEPARTURE
BALL BEARINGS

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT

124

52100 steel is ideal for all these parts

1. Diesel injection pumps
2. Lathe centers
3. Slitting rolls and knives
4. Cam rollers for automotive steering gears
5. Machine tool parts
6. Pump parts
7. Aircraft engine parts
8. Mechanical seals
9. Saw mill rollers
10. Anti-friction bearings
11. Asbestos disintegrators
12. Mill rolls

. . . and for others like them

Need a steel that's hard, tough, and easy to machine? 52100 steel is the answer. It's a high-fatigue-strength, high-tensile-strength steel that can be oil-quenched in moderate sections to a maximum hardness of Rockwell C65/66. 52100 withstands working pressures of 200,000 p.s.i. And because of its fully spheroidized structure, it offers excellent machining characteristics.

52100 steel is available in bars, tubes and wire—and The Timken Roller Bearing Company, one of the world's largest producers of 52100 steel, is the *only* source of *all three.* A wide range of sizes in each form is made to meet your needs.

We maintain a mill stock of 52100 tubing to fill small run requirements. You can select from 101 sizes, ranging from 1″ to 10½″ O.D. and get shipment within 24 hours after the receipt of your order. Complete, rigid quality control in the Timken Company plant assures you of uniform quality in every shipment.

Originally developed for anti-friction bearings, 52100 steel offers big advantages for any machined part requiring great strength and resistance to wear. For a stock list of available sizes, grades and finishes, write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.

The Business Trend

Railroad switchmen's work stoppages switch industrial production index from upward movement to a downfall. Materials shortages that will result will be felt for weeks

DON'T EXPECT any new industrial production records in the next few weeks. The railroad switchmen's strike and severe winter weather have been enough to forestall them.

So severe was their impact that they not only halted the strong upward movement of STEEL's industrial production index but drove it down 9 points in the week ended Feb. 3. That skid put the index down to 211 per cent of the 1936-1939 average. Before it toppled, the index had reached 220 per cent, only 2 points below the postwar high set last October.

But even after the drop the index is substantially above the level of a year ago. Then it was 188.

While the strike and the cold weather were immediately reflected by the drop in the index their effects will not be as quick in disappearing. Materials and parts that didn't get produced will be missed over weeks to come as industry tries to meet a big civilian demand at the same time it is taking on an ever-growing defense assignment.

Downfall of Carloadings . . .

Most obvious decline as a result of the switchmen's strike was in railroad freight car loadings. For the week ended Feb. 3, the week in which the work stoppage began, car loadings are estimated by STEEL at 588,000. That contrasts with the preceding week's 784,185, highest recorded since the week ended Nov. 18.

Auto Output Loses Speed . . .

The railway strike immediately applied the brakes on the auto industry's pace. Unable to receive shipments of parts when needed, the auto industry had to cut its output of passenger cars and trucks to 152,721 units in the week ended Feb. 3. It had just got its production up in the week ended Jan. 27 to 167,869 units, highest level since the week ended Dec. 16. But even after the drop, output is higher than that in the comparable week of a year ago when 127,428 passenger cars and trucks were produced.

Truck production this year may closely approach, or possibly even exceed, the alltime record volume of 1,369,000 units made in 1948, says *Ward's Automotive Reports*. The reason? Military orders and high demand for civilian models needed for a defense economy.

Steel Output Hurt Too . . .

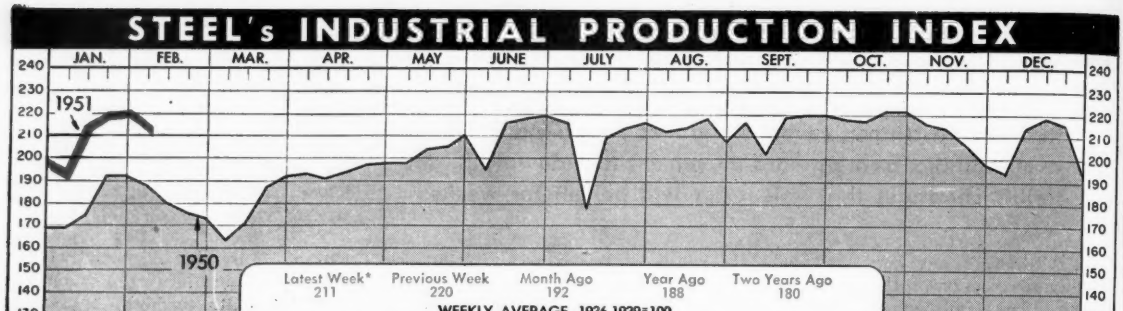
Steel ingot producers were affected by the rail strike to only a minor extent in the week ended Feb. 3 and in that week were able to set a new record of 2,025,000 net tons. But by the week ended Feb. 10 the strike's fangs were beginning to sink in, and the American Iron & Steel Institute expected steel ingot production to slip off to 1,933,100 tons.

Plant Expansion Rolls On . . .

The wave of industrial plant expansion set off by the national mobilization continues to roll forward. In the week ended Feb. 1, contracts

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	101.5	100.0	98.0	94.0
	Electric Power Distributed (million kilowatt hours)	7,099	6,970	6,602	6,062
	Bituminous Coal Production (daily av.—1000 tons)	1,896	1,863	1,569	1,250
	Petroleum Production (daily av.—1000 bbl)	5,938	6,066	5,788	4,945
	Construction Volume (ENR—Unit $1,000,000)	$235.1	$305.3	$154.2	$160.7
	Automobile and Truck Output (Ward's—number units)	152,721	167,869	99,955	127,428
	*Dates on request. †Weekly capacities, net tons: 1951, 1,999,035; 1st half 1950, 1,906,268; 2nd half 1950, 1,928,721.				
TRADE	Freight Car Loadings (unit—1000 cars)	588†	784	662	613
	Business Failures (Dun & Bradstreet, number)	159	193	144	199
	Money in Circulation (in millions of dollars)‡	$27,045	$27,028	$27,685	$26,928
	Department Store Sales (changes from like wk. a yr. ago.)‡	+25%	+31%	+20%	+2%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$16,539	$16,952	$17,923	$13,266
	Federal Gross Debt (billions)	$256.1	$256.0	$256.2	$256.8
	Bond Volume, NYSE (millions)	$25.9	$27.1	$20.9	$22.0
	Stocks Sales, NYSE (thousands of shares)	14,247	12,779	14,351	10,109
	Loans and Investments (billions)†	$70.4	$70.4	$71.8	$67.8
	United States Gov't. Obligations Held (millions)†	$32,443	$32,634	$33,674	$38,077
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	171.92	171.92	171.92	156.13
	STEEL's Nonferrous Metal Price Index‡	262.2	261.0	248.7	159.9
	All Commodities†	180.5	180.0	176.8	151.8
	Metals and Metal Products†	188.7	188.4	187.4	168.9
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
1951
1950
Latest Week* 211
Previous Week 220
Month Ago 192
Year Ago 188
Two Years Ago 180
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
COPYRIGHT 1951 STEEL

Week Ended Feb. 3

awarded for industrial plant construction totaled $128.3 million, equivalent to more than half of that week's $235 million total of engineering construction awards, *Engineering News-Record* reports.

The continuing flood of industrial building contracts rolled up a $507 million total in the first five weeks of this year for a 510 per cent gain over the corresponding period of last year.

Total of heavy construction contracts awarded in the first five weeks of 1951 is $1.5 billion, a 40 per cent gain over the like period of last year. Private construction, pushed up to $838.8 million by the heavy industrial awards, is 62 per cent higher than last year. Public works at $663 million are up 19 per cent.

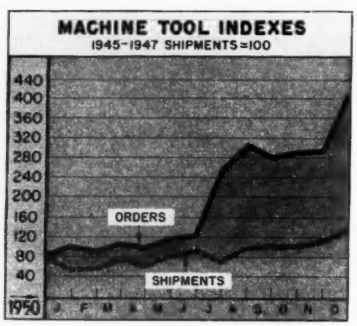
Construction Booming . . .

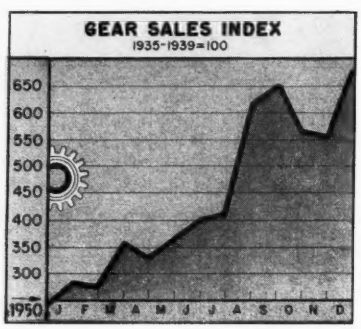
Construction activity in January was one-fifth higher than in the corresponding month a year ago, reports the U. S. Departments of Commerce and Labor. Total value of new construction put into place was almost $2.1 billion. Privately-financed construction put into place in January was valued at more than $1.5 billion; new homebuilding which continued at record levels for this season of the year accounted for more than half of the total private outlays for new construction.

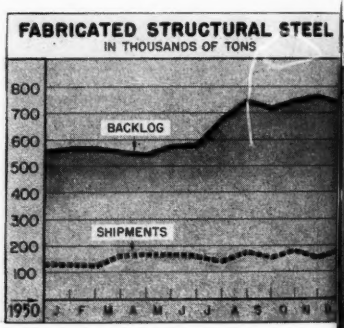
Public expenditures for new construction during January amounted to about $500 million.

Fewer Lay-Offs . . .

Although lay-offs due to materials and parts shortages may result from the rail switchmen's strike, they were declining in January. They rose, says the U. S. Department of Labor, to 23,900 in the week ended Jan. 6 but declined sharply since then. Lay-







Machine Tool Indexes

	New Orders 1950	New Orders 1949	Shipments 1950	Shipments 1949
Jan.	99.7	87.0	52.8	68.8
Feb.	89.2	80.9	56.1	70.3
Mar.	107.4	93.5	75.3	75.8
Apr.	98.9	70.1	61.6	74.7
May	116.4	63.7	82.5	72.8
June	124.1	53.6	91.9	79.0
July	253.1	48.0	68.3	60.7
Aug.	305.1	51.5	95.7	67.3
Sept.	280.6	57.7	101.6	67.6
Oct.	289.6	56.8	100.9	62.3
Nov.	291.9	84.3	110.9	67.6
Dec.	410.1	82.5	135.7	75.7

National Machine Tool Builders' Asso.

Gear Sales Index
1935—1939=100

	1950	1949	1948
January	280.2	320.7	346.8
February	272.9	282.3	324.4
March	358.4	299.1	389.8
April	328.6	339.0	320.9
May	363.1	250.1	283.6
June	401.0	227.8	324.1
July	410.7	193.1	384.4
August	617.4	262.0	335.6
September	654.5	224.9	320.4
October	564.8	242.3	333.3
November	554.9	230.7	309.0
December	680.4	242.8	325.9

American Gear Mfrs. Association

Fabricated Structural Steel
Thousands of Net Tons

	Shipments 1950	Shipments 1949	Backlog 1950	Backlog 1949
Jan.	135.2	152.7	565	675
Feb.	129.6	145.9	565	683
Mar.	156.8	185.9	556	582
Apr.	164.4	179.2	540	628
May	168.1	171.1	578	599
June	172.1	172.3	580	583
July	141.6	148.0	684	605
Aug.	180.7	183.9	741	583
Sept.	157.0	162.1	716	562
Oct.	183.3	99.8	747	584
Nov.	167.1	117.2	763	527
Dec.	175.6	135.5	736	555
Total	1,931.5	1,853.5	...	...

American Institute of Steel Construction

Charts—Copyright 1951, STEEL

offs resulting from materials shortages dropped to 12,800 in the week ended Jan. 13 and to 4600 in the week ended Jan. 20.

Price Index Still Goes Up . . .

The government's Jan. 26 freeze on prices wasn't enough to put the government's wholesale price index on ice. The index was as active as ever, and in the week ended Jan. 30 set another new alltime high by climbing to 180.5 per cent of the 1926 average. That was a rise of half a point over the preceding week, and 28.7 points over a year ago.

Continued climb of the index is possible because some commodities and services are exempted from the price freeze.

Buy and Buy . . .

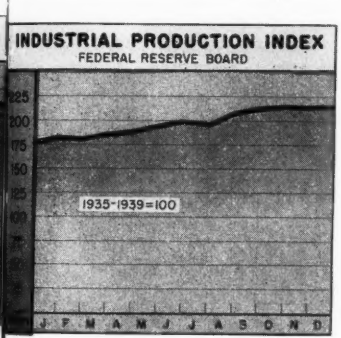
Price freezing hasn't been enough to discourage large-scale buying. Consumer purchasing, for instance, pushed department store sales in the week ended Jan. 27 to 25 per cent above the dollar volume of the corresponding week of last year. Consumers are hedging against feared shortages of merchandise and higher taxes on many items.

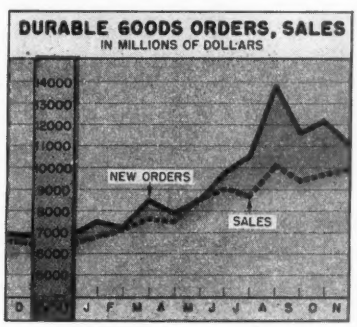
Trends Fore and Aft . . .

Sales of television picture tubes to receiver manufacturers in 1950 amounted to 7,473,614 units valued at $198,737,428, compared with 3,305,673 tubes valued at $92,402,520 in 1949 . . . Radio receiving tube sales jumped 93 per cent and totaled 383,960,599 tubes in 1950, compared with 198,753,295 in 1949 . . . Industrial furnace sales in 1950 were valued at $53,433,079, compared with only $16,658,600 in 1949 . . . Kropp Forge Co., Chicago, has 42 per cent of its total production on war orders, and its order backlog is $9 million after climbing from $8,750,000 in mid-January . . . If your income hasn't doubled in the last ten years you haven't kept up with inflation, a report by the National Industrial Conference Board shows.

Issue Dates of Other FACTS and FIGURES Published by STEEL:

Construction Feb.5	Malleable Cast. Feb.5	Refrigerators Jan.15
Employ., Steel Jan.29	Metalwkg. Employ..Jan.8	Steel Castings Jan.29
Foundry Equip. Jan.29	Price Indexes Jan.22	Steel Forgings Jan.29
Freight Cars Jan.22	Pumps, New Orders.Feb.5	Steel Shipments Dec.25
Furnaces, Indus. ...Jan.22	Purchasing Power...Feb.5	Vacuum Cleaners ..Jan.15
Furnaces, W. Air...Jan.22	Radio, TV Aug.14	Wages, Metalwkg. .Jan.29
Gray Iron Castings..Jan.8	Ranges, Elec. Feb.5	Washers Jan.15
Ironers Jan.15	Ranges, Gas Dec.4	Water Heaters Dec.25





Industrial Production Index

	Total Production 1950	1949	Iron, Steel 1950	1949	Non-ferrous 1950	1949
Jan.	183	191	203	228	180	184
Feb.	180	189	201	232	190	185
Mar.	187	184	205	233	200	183
Apr.	190	179	222	219	198	168
May	195	174	226	204	197	145
June	199	169	231	177	207	132
July	196	161	228	156	202	128
Aug.	209	170	236	178	212	141
Sept.	211	174	245	179	216	157
Oct.	217	166	253	103	223	164
Nov.	215	173	247	144	226	163
Dec.	216	179	253	198	226	165
Avg.	200	176	229	187	206	160

Federal Reserve Board

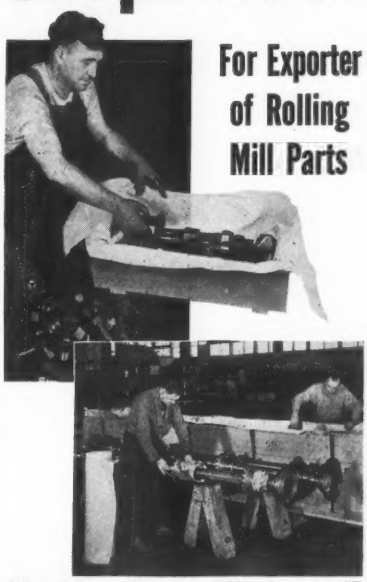
Durable Goods Orders, Sales

In Millions of Dollars

	New Orders 1950	1949	Sales* 1950	1949
Jan.	7,479	6,370	6,817	7,120
Feb.	7,213	6,336	7,103	7,290
Mar.	8,508	6,840	7,643	7,372
Apr.	7,857	5,725	7,488	7,029
May	8,514	5,356	8,605	6,901
June	9,814	5,981	9,030	7,154
July	10,553	5,622	8,670	6,671
Aug.	13,863	6,831	10,060	7,387
Sept.	11,500	7,099	9,392	7,335
Oct.	12,171	6,892	9,671	6,167
Nov.	11,056	6,941	9,909	6,631
Dec.	....	6,923	....	6,516

* Seasonally adjusted. U. S. Office of Business Economics

How Vapor Stops Rust



For Exporter of Rolling Mill Parts

Slushing Costs Eliminated! Packaging Time Slashed!

WITH

Angier VPI* Wrap

This amazing box liner does it!

Inside these overseas-bound crates the chemical coating on Angier VPI Wrap slowly releases an invisible vapor. It permeates the area around these rolling mill parts . . . prevents rust almost like magic! So effective is this proven vapor rust preventive that rejects due to rust are eliminated. Slushing in grease or oil is not necessary — this means "cleaning" costs for customers are eliminated! Substantial savings in packaging time for VPI-users is an obvious fact!

For facts that tell how *you* can ship and store metal articles or parts RUST-FREE at less cost . . . write today to:

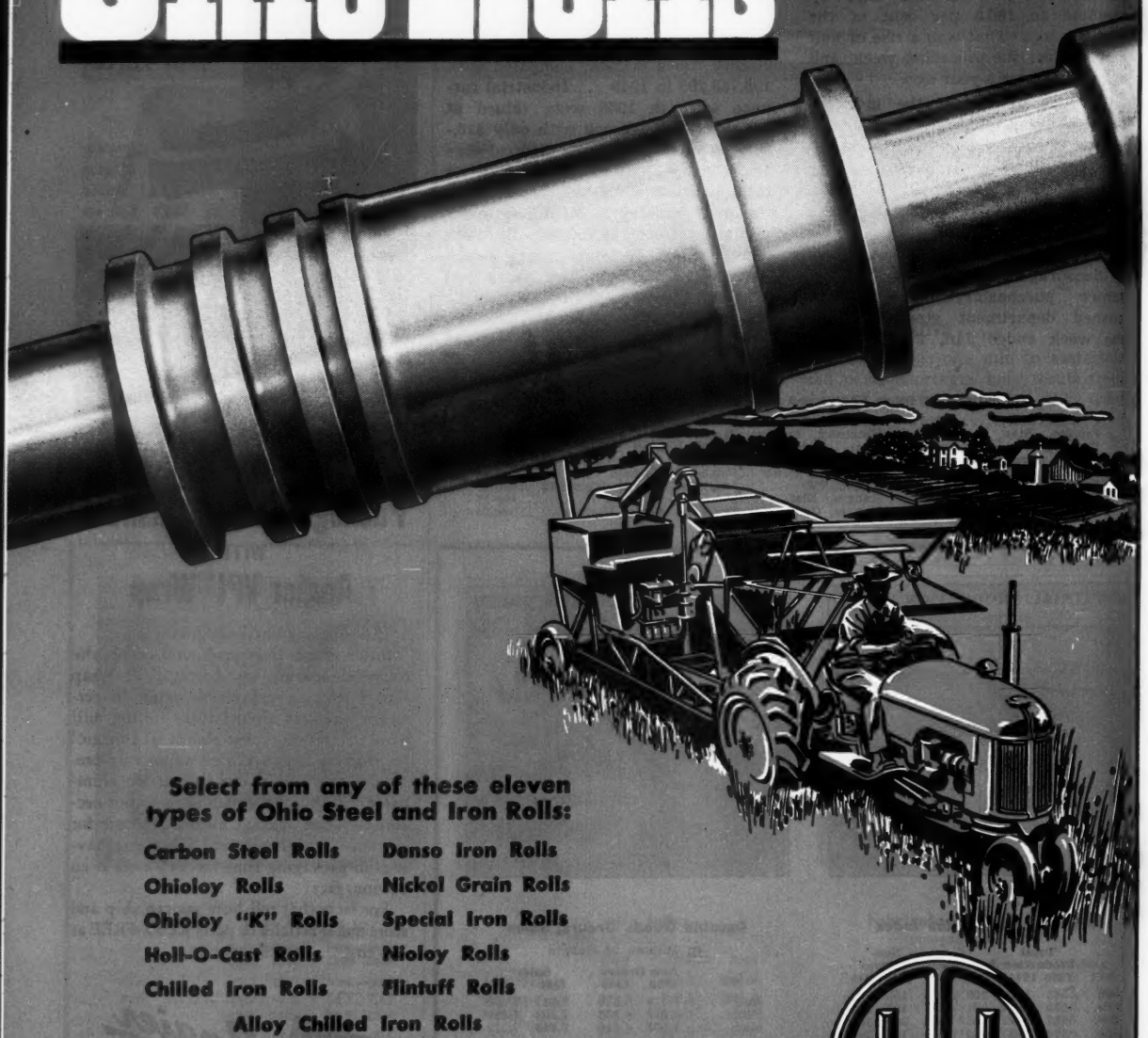
*Reg. U. S. Pat. Off. Vapor rust preventive

Angier CORPORATION
Framingham 8, Mass.
Industrial Packaging Engineers since 1895
Representatives and Distributors in Principal Cities

Angier Corp., Framingham 8, Mass.
Yes Send case studies of your revolutionary vapor rust preventive TO:

Shaping Metal for all Industry

Ohio Rolls



Select from any of these eleven types of Ohio Steel and Iron Rolls:

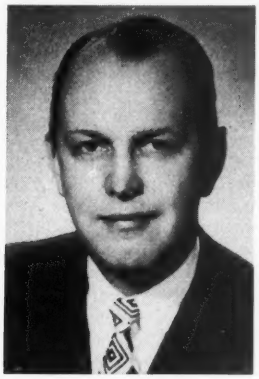
Carbon Steel Rolls	Denso Iron Rolls
Ohioloy Rolls	Nickel Grain Rolls
Ohioloy "K" Rolls	Special Iron Rolls
Holl-O-Cast Rolls	Nioloy Rolls
Chilled Iron Rolls	Flintuff Rolls
Alloy Chilled Iron Rolls	

THE OHIO STEEL FOUNDRY COMPANY

LIMA, OHIO • Plants at Lima and Springfield, Ohi

Men of Industry

ALBERT J. BOLD
. . . exec. V. P., Superior Metal Fabricating



OSCAR L. OLSON
. . . Swedish Crucible president and gen. mgr.

E. R. WALSH III
. . . gen. sales mgr. at Alloy Rods

Albert J. Bold was elected executive vice president, **Superior Metal Fabricating Co.**, Niles, O. He served as superintendent of National Gypsum Co.'s plant in Niles. Superior Metal, a new company, will do coil and sheet steel slitting, job shearing, punch press and cold rolled forming fabrication.

George Tarbox was appointed assistant to the superintendent, major alloys division, Electro Metallurgical Division, **Union Carbide & Carbon Corp.**, Niagara Falls, N. Y.

Rheem Mfg. Co., Richmond, Calif., has formed an aircraft department to be headed by **Laurence H. Cooper**, recently vice president and general manager, Pacific Airmotive Corp. A 50-acre site near the Rheem plant at South Gate, Calif., has been purchased, and a contract let for a building specially designed to handle aircraft work.

Yale & Towne Mfg. Co., Philadelphia, appointed **Albert A. Goodman** manager of quality control, Philadelphia division, and **Edwin J. Heimer** as sales manager of hand lift and motorized hand trucks, same division, to succeed **W. Glen Tipton**, who retires Mar. 1.

J. L. Hiers was appointed assistant general manager, **Woodhouse Chain Works**, Round Associate Chain Co., Trenton, N. J.

Thur Schmidt was appointed assistant to the president, Ingersoll Products Division, **Borg-Warner Corp.**, Chicago. He was general manager, Highway Steel Products Co.

Swedish Crucible Steel Co., Detroit, elected **Oscar L. Olson** as president and general manager to succeed his father, the late **Nels L. Olson**, who established the business 41 years ago. Since 1942 the new president has been general manager of the company's plastic division.

Jones & Laughlin Steel Corp., Pittsburgh, appointed **Clem W. Gottschalk** as assistant vice president in charge of traffic. Since 1941 he has been general traffic manager, a position he retains.

Harold G. Lolley joined **Rosedale Foundry & Machine Co.**, Pittsburgh, as foundry superintendent. He had been with Bucyrus Erie Co., where since 1946 he was iron foundry superintendent and metallurgist.

Edgar H. Betts was elected chairman of the board of **W. & L. E. Gurley**, Troy, N. Y. **Charles E. Smart** was re-elected to a new term as president. **Robert G. Betts**, former treasurer, was elected vice president and treasurer. **Lester C. Higbee**, general sales manager and director of engineering, retains the position of secretary.

Herbert L. Schultz was appointed plant manager, **Mid-West Abrasive Co.'s** new abrasive grain plant, Owosso, Mich.

New division heads appointed to the automotive and aircraft engineering departments of **Kaiser-Frazer Corp.**, Willow Run, Mich., include: **George C. Harbert**, named chief engineer in charge of automotive, and **Ralph H. Isbrandt**, appointed chief engineer in charge of aircraft.

E. R. Walsh III was appointed general sales manager, **Alloy Rods Co.**, York, Pa. He has been with the company for several years as district sales manager.

Peyton S. Hopkins was named to manage the Washington office of **Rust Engineering Co.** He succeeds **Richard E. Butler**, retired.

R. K. Laurin was appointed assistant advertising manager, meter and valve division, **Rockwell Mfg. Co.**, Pittsburgh.

Douglas E. Thompson was appointed manager of by-products sales by **Budd Co.**, Philadelphia. His headquarters are at the Hunting Park plant, Philadelphia.

Fielder Israel was named assistant to the president, **General Dry Batteries Inc.**, Cleveland. He resigned last fall as vice president-production, National Carbon Division, Union Carbide & Carbon Corp., with which he was associated 27 years.

Frederick G. Riedel was appointed chief engineer, **United States Air Conditioning Corp.**, Minneapolis. He formerly was chief engineer and works director of research at the Holyoke Works, Worthington Pump & Machinery Corp.

Mercury Mfg. Co., Chicago, appointed **E. B. Forslund** manager of the New York sales office to replace **Conrad Hibbeler**, retired. **H. G. Hemberg** succeeds Mr. Forslund as manager of the Philadelphia sales office. **A. E. Radcliffe**, Cleveland manager, was

transferred to the factory office at Chicago where he is assistant to the general sales manager. He is succeeded at Cleveland by **Melville F. Hoff.**

C. L. Fix was named works manager

C. L. FIX
. . . works mgr., Mullins Liberty plant

of **Mullins Mfg. Corp.'s** Liberty plant at Warren, O., which will make shells for the Army. Mr. Fix joined Mullins in 1950 as director of quality.

H. B. Ives Co., New Haven, Conn., appointed **Eric Wilkinson** as a specialist in war procurement business.

Robert M. Critchfield, former factory manager, Delco-Remy Division, **General Motors Corp.,** was appointed assistant general manager of GM's Allison Division in Indianapolis. **A. C. Stanley,** plant superintendent of the Delco Battery plant in New Brunswick, N. J., was named manager of the plant succeeding **E. E. Ward,** transferred to the Fabricast Division at Bedford, Ind., where he will serve as administrative assistant to the general manager of that division. Succeeding Mr. Stanley as plant superintendent is **George P. Dick,** while **F. E. Jones** becomes chief inspector. **W. A. Brunsted,** personnel manager for the Delco plant, joined the labor relations staff of Delco-Remy Division, Anderson, Ind., and is succeeded by **L. M. Hirsch.**

Philip D. Moore was appointed manager of employee and community relations, **Carboloy Co. Inc.,** Detroit.

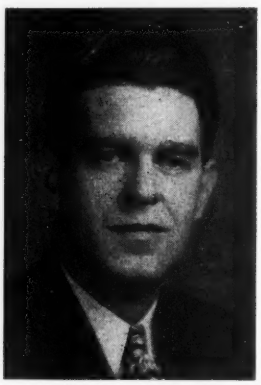
Tumb-L-Matic Inc., Bronx, N. Y., appointed **Richard T. Barnes** West Coast representative. He operates out of San Francisco, with a mail address of P. O. Box 227.

John W. Willard was appointed sales training manager and director of personnel for **Lamson Corp.,** Syracuse, N. Y.

Sales representatives appointed by **Rigidized Metals Corp.,** Buffalo, include: **Robert J. Wagner** covering the West Coast, Washington, Oregon and California; **Disque Steel Products Co.,** covering Indiana; and **Adler Steel Products Co.,** covering Minnesota.

Charles H. Merbitz was appointed sales representative, type metal department, Federated Metals Division, **American Smelting & Refining Co.** He will have headquarters at Federated's Philadelphia sales office in the Lincoln-Liberty building.

Henry E. Warren Jr. was appointed assistant general superintendent, and **Forest J. Smith,** assistant to general superintendent of the new Fairless Works of **United States Steel Co.** to



HENRY E. WARREN JR.
. . . asst. gen. supt., new Fairless Works

be built at Morrisville, Pa. **Robert O. Thomas** succeeds Mr. Warren as open-hearth division superintendent at Homestead District Works, and **John W. Price Jr.** was named assistant to general superintendent. Other Homestead appointments include **William E. Crouch Jr.** as superintendent, slabbing and plate division, and **John V. Dorman,** superintendent, fuel and power division.

Edward Valves Inc., East Chicago, Ind., appointed **Bruce K. Stabelfeldt** advertising and sales promotion manager. He was advertising manager, Blackhawk Mfg. Co.

H. C. Buckingham, vice president, **Thor Corp.,** Chicago, was appointed to direct the firm's defense production.

Three sales representatives, all mechanical engineers, newly named to **Allis-Chalmers Mfg. Co.'s** general machinery division offices in the South are: **John P. McLaney** and **Webster C. English,** assigned to the Charlotte, Va., district office; and **Andrew J. Beall Jr.,** named to the New Orleans office. Assigned to the Chicago and Duluth district offices, respectively, are **John R. Cooper** and **Thomas M. Franey.**

Metals Disintegrating Co. Inc., Elizabeth, N. J., promoted **John A. McKinley** to supervisor of pigment sales.

DeWalt Inc., Lancaster, Pa., appointed **O. Stanley Swandahl** district manager for Lake county, Illinois, and various trading areas of Wisconsin.

N. H. Balaam, northern California district sales manager, **Kaiser Steel Corp.,** Oakland, Calif., was transferred to Washington to manage the company's recently opened offices there. Temporary headquarters in the Ring building will be vacated about Mar. 1 and offices established in the Cafritz building. **C. F. Cooper** was assigned as acting district sales manager, northern California.

Trumbull Electric Mfg. Co., Plainville, Conn., appointed **Charles Bangert Jr.** manager of engineering, and **J. J. Pascher** New York district sales manager.

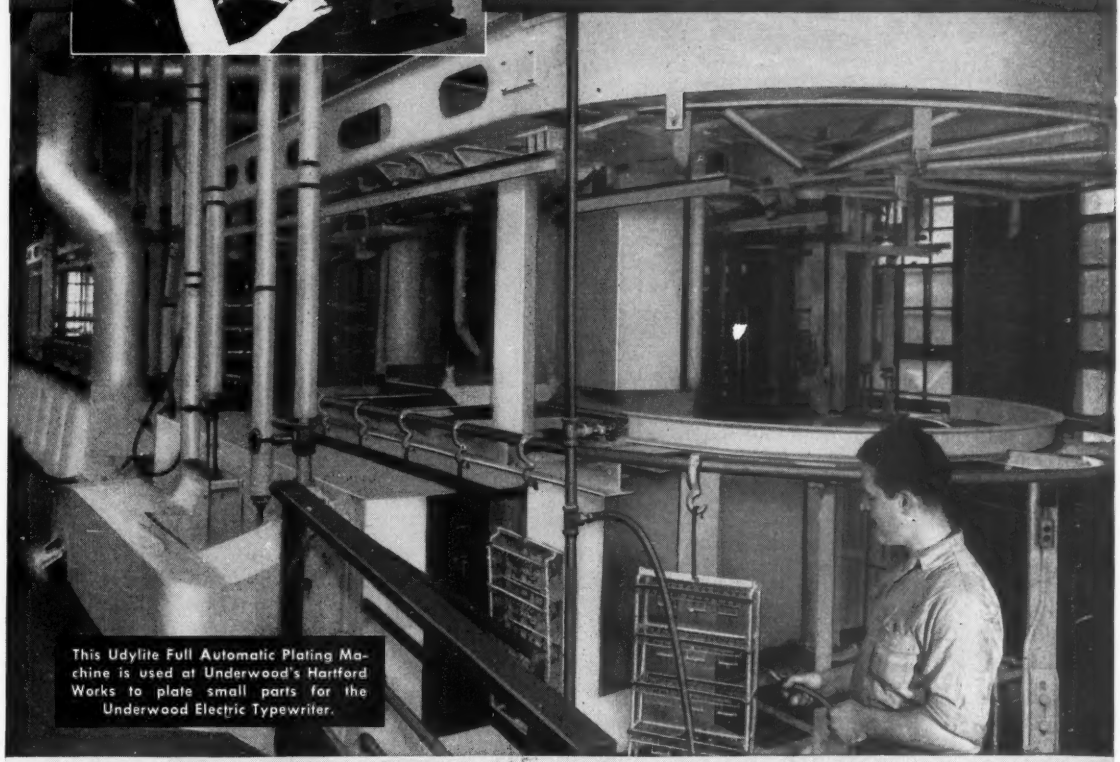
John W. Oehler was named sales manager, engineering works division, **Dravo Corp.,** Pittsburgh. He joined

JOHN W. OEHLER
. . . Dravo sales mgr., engineering works div.

the corporation in 1946 and has since been a member of the sales engineering staff.

David C. Prince, vice president, **General Electric Co.,** Schenectady, N. Y., was named to the president's staff,

UDYLITE FULL AUTOMATIC is key to better plating for Underwood Typewriters



This Udylite Full Automatic Plating Machine is used at Underwood's Hartford Works to plate small parts for the Underwood Electric Typewriter.

Another great name in American Industry—the Underwood Corporation—has found Udylite equipment and processes supply a ready answer to plating problems. Underwood reports—since installation of their new Udylite Full Automatic Plating Machine for Bright-Nickel application to typewriter parts—that rejects have been virtually eliminated and hand buffing operations on many small parts are now no longer required. This is in addition to a substantial saving in manpower over their previous equipment.

The Udylite Full Automatic offers: (**1**) Modern, simplified design for easy maintenance; (**2**) Rugged, integrated frame and base for rapid installation and long-lived durability; (**3**) Hydraulic lift and transfer mechanism for smooth, efficient operation; (**4**) Independent lift and transfer controls for meeting various plating requirements.

These and many other advantages have made Udylite equipment the first choice of platers everywhere. Let your Udylite Technical Man show you how Udylite methods and machines can bring tangible benefits to your plating operations. Call him in today. There's no obligation. Or write direct to *The Udylite Corporation, Detroit 11, Michigan.*

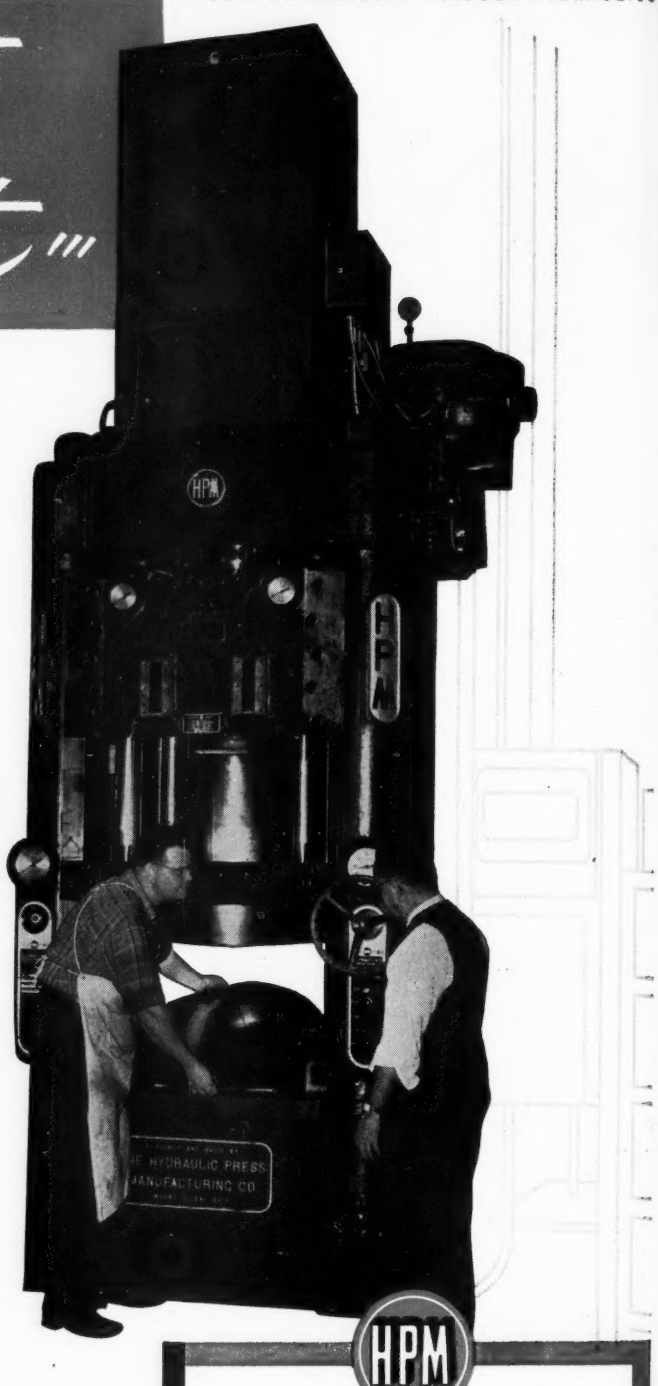
PIONEER OF A BETTER WAY IN PLATING

THE Udylite CORPORATION
DETROIT 11, MICHIGAN

SERVING INDUSTRY THROUGH HYDRAULICS

short 'n sweet"

SPERRY GYROSCOPE COMPANY ECONOMICALLY USES 150-TON H-P-M PRESS ON SHORT RUNS FOR MORE THAN A HUNDRED DIFFERENT DRAWING JOBS!



● Versatile and yet economical production is an accomplished fact in the pressed metal department of Sperry Gyroscope Company's Lake Success, N. Y., Plant.

With an H-P-M 150-ton FASTRAVERSE Press, Sperry handles runs of 300 pieces per set-up on 101 different jobs—jobs that vary greatly in size, depth of draw, and gauge of metal (2SO, 3SO or 52SO aluminum sheet is used).

The big factor in this production picture can be found in the exclusive operational features of the H-P-M press itself. H-P-M's FASTRAVERSE hydraulic power system provides quick and easy adjustment of press speeds, strokes and pressures to suit each individual die set-up and part to be drawn . . . cutting set-up time to a minimum . . . protecting dies . . . and assuring parts production with negligible scrap loss.

Find out about versatile H-P-M FASTRAVERSE Presses today—and how they can cut costs out of your present production methods— an H-P-M Engineer will gladly provide you with complete details.

Write today for your free copy of Bulletin 5005 which completely describes H-P-M FASTRAVERSE and other special purpose H-P-M Presses.

HPM

THE HYDRAULIC PRESS MFG. CO.

1044 MARION ROAD - MT. GILEAD, OHIO, U. S. A.

Makers of Presses for the Metal Working and Processing Industries - Plastic Molding Presses - Die Casting Machines - Hydraulic Pumps, Valves and Power Units

with special duties as assigned. **Harry A. Winne,** vice president-engineering policy, was assigned responsibility formerly held by Mr. Prince for the GE general laboratory. **Ernest E. Johnson** was appointed to the newly created post of general manager of the laboratory. All three men continue headquarters in Schenectady. **Mark K. Howlett,** chemical department, was appointed silicone sales supervisor with headquarters at Waterford, N. Y. **Emil R. Schaeffer** becomes manager-manufacturing, Switchgear divisions, Philadelphia.

Carroll V. Roseberry was appointed manager, central station department, **Westinghouse Electric Co.,** Pittsburgh, to succeed **R. S. Kersh,** named manager of the company's steam division, Lester, Pa. **L. D. Rigdon,** formerly manager of the headquarters manufacturing department, was named assistant to vice president in charge of manufacturing, and **C. G. Wallis** was named to succeed Mr. Rigdon. **W. G. Miller** was appointed manager of manufacturing for the motor and control division, Buffalo. **Roger W. Doering** was named supervisor of plant engineering, lamp division, Bloomfield, N. J. **Clarence Lynn** was appointed engineering manager, atomic power division, Pittsburgh, and **William L. Budge** will manage facilities near Idaho Falls, Idaho, for the division.

Dr. Bruce S. Old was elected vice president of **Arthur D. Little Inc.,** Cambridge, Mass. With the company since 1946, he was in charge of process metallurgy, and has been a director since 1949.

Wilson S. Dobbin was appointed sales manager, **H. J. Sommers Inc.,** Detroit.

CHESTER F. DELBRIDGE
. . . gen. sales mgr., K-G Equipment

Chester F. Delbridge was appointed general sales manager of **K-G Equipment Co. Inc.,** new name of K-G Welding & Cutting Co. Inc., New York. Mr. Delbridge's office is at 50 Broadway, New York 4, the executive sales office of the company. The factory address on 29th street is unchanged. Mr. Delbridge joined K-G, a unit of Air Products Inc., six months ago.

Donald Patterson, production control manager, **National Motor Bearing Co. Inc.,** Redwood City, Calif., was promoted to factory manager succeeding **Col. B. W. Holmes,** recalled to active service in the Air Force.

J. Truman Stone was appointed sales promotion manager, Kelvinator Division, **Nash-Kelvinator Corp.,** Detroit.

Ivar G. Blackberg was appointed chief purchasing agent, radio and television division, **Stewart-Warner Corp.,** Chicago. The division has moved to 1300 N. Kostner Ave.

DELMAR WOODHOUSE
. . . Kropp Forge secretary

Delmar Woodhouse was elected secretary of **Kropp Forge Co.,** Chicago, which he joined in 1943. For the last four years he has been controller, which position he continues to hold.

F. O. Dutton joined the staff of **Bendix Home Appliances,** division of Avco Mfg. Corp., South Bend, Ind., and will serve as assistant to the director of purchases.

Cold Metal Products Co., Youngstown, appointed **W. C. Thompson** Cleveland district sales manager.

R. C. Patterson was elected vice president, **Geneva Metal Wheel Co.,** Geneva, O.

Link-Belt Co., Chicago, appointed **Orvin K. Gaskins** manager of aircraft and assigned sales for its Ewart plant in Indianapolis.

Joseph W. S. Davis was appointed assistant to the vice president, eastern regional sales, **American Locomotive Co.,** New York.

OBITUARIES...

Edward L. Holljes, 66, general sales manager, **William Sellers Co.,** a division of Consolidated Machine Tool Corp., Philadelphia, died Feb. 3.

Alexander W. MacLean, 61, vice president and sales manager, **MacLean-Fogg Lock Nut Co.,** Chicago, died Jan. 28.

Lee C. Bock, 58, general purchasing agent, **Gulf Oil Corp.,** Pittsburgh, died Feb. 3.

John M. Watson, 94, one of the founders of Pennsylvania Engineering Co., New Castle, Pa., and general manager of that plant for a number of years, died Feb. 2. He later joined in forming **Canonsburg Steel & Iron Works,** Canonsburg, Pa., where he remained for 30 years as vice president and general business manager. He retired from this firm at the age of 72 years, and returned to New Castle.

George J. Blum, 81, president, **Armstrong-Blum Mfg. Co.,** Chicago, died Jan. 10.

Ralph A. Shaffer, 72, who retired in 1940 as general sales manager, **Simonds Saw & Steel Co.,** Fitchburg, Mass., died Jan. 6. He was with the company for nearly half a century.

Avery D. Byler, 67, former president of **Edison General Electric Co.,** now Hotpoint Inc., Chicago, died Jan. 27.

Willard N. Lynch, president, **Keystone Drawn Steel Co.,** Spring City, Pa., died Jan. 25.

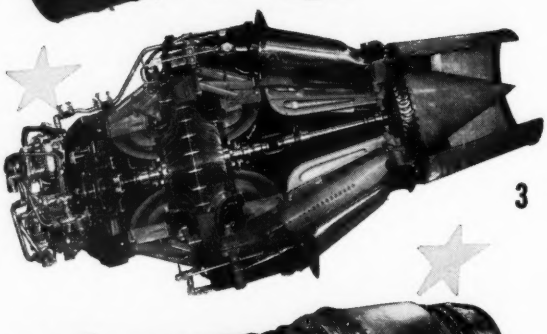
Charles A. Sullivan, 82, until retirement seven years ago in charge of traffic for **Fisher Body,** General Motors Corp., Detroit, died Jan. 31.

Albert T. Potter, 65, until retirement last September chief engineer, **Ainsworth Mfg. Co.,** Detroit, died Feb. 1.

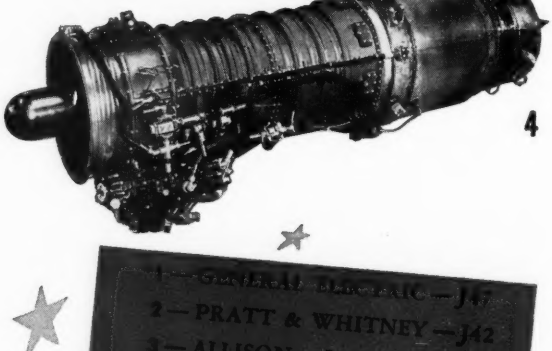
RINGS THAT GO IN A STRAIGHT LINE

1

2



3



4

Since the inception of jet aircraft engines, American Welding has been closely associated with leading jet engine manufacturers*. Welded stainless steel rings that stand the gaff of supersonic speeds travel through our production lines — *fast!*

In addition to jet rings, we form, weld, heat-treat and machine a wide variety of rings, bands and assemblies to exact specifications, from both ferrous and non-ferrous metals.

Whatever your requirements, we can apply this same skill to your products. Send in your prints and quantities for prompt quotation, and be sure to ask for our illustrated booklet which will acquaint you with our company, our facilities and many of the products we furnish.

1 — GENERAL ELECTRIC — J47
2 — PRATT & WHITNEY — J42
3 — ALLISON — J33
4 — WESTINGHOUSE — J34

THE AMERICAN WELDING & MANUFACTURING CO. · WARREN, OHIO

110 DIETZ ROAD • • WARREN, OHIO

Production AND Engineering
NEWS AT A GLANCE

FILE FOR THE FUTURE— A 90-6-4 mixture of tungsten, nickel and copper powders, manufactured by Carboloy Co. under the trade name Hevimet, is seen as having significant possibilities by virtue of its 50 per cent greater density than lead in such parts as balance weights on crankshafts, gyroscopes, variable-pitch propellers, centrifugal clutches and similar moving parts. High density enhances the resistance to penetration of radioactive rays and suggests uses such as gamma ray screens for radiotherapy. Hevimet has minimum density of about 17 grams per cubic centimeter, has tensile properties comparable with those of most nonferrous metals and alloys, is readily machinable but somewhat difficult to thread. In production of parts the powders are ball milled, pressed into approximate final shape and then sintered in a reducing atmosphere. Welding or silver solder brazing can be used in fabrication of complex shapes, and plating with cadmium, chromium or nickel is possible.

HEAT TREAT STRESSES EASED— Interrupted quenching of gears and other transmission parts, ranging in weight from 8 ounces to 12 pounds, in mass production quantities, has eliminated (p. 73) the use of quenching presses, plugs and special fixtures, at the same time providing parts with double or triple the service life and 15-20 per cent better load-carrying capacity. A typical gear of 4820-H steel, carburized at 1700° F, is quenched in oil at 400° F, cooled for 4 hours at room temperature, washed and tempered at 300° F for 90 minutes, yielding a fine martensitic case structure with Rockwell C hardness of better than 60 on the surface of the teeth.

PRESERVATIVES FOR PACKAGING— Vapor phase inhibitors (VPI) are now being used by Ordnance for the preservation of weapons awaiting issue. They replace cosmoline, a thick coating used on many firearms during World War II and requiring boiling water, solvents and plenty of muscle to remove. VPI materials are of various types, one being dicyclohexylamine nitrite, patented by the Shell Development Co. A box of ten rifles packed in VPI wrappings can be unpacked with rifles prepared for use in 35 minutes. Extensive use of VPI materials has been made in many types of industrial packaging applications. They are suitable only on ferrous metals and when storage is involved a light oil coating should be applied first as a preservative.

COMPLEX SHELLS PLATED— Where you need a thin, intricately shaped metal shell, produced without machining or press operations, electroforming provides an efficient fabricating method. A variety of metals—nickel, copper, silver, even iron—can be electroplated over mandrels, either of the permanent or one-shot type, the latter being melted or dissolved out of the plated shell and then reused. Unique variant of the process (p. 77) is electroforming of metal screen.

BLOCK BOTTOM— Taking their cue from carbon block hearths now widely used in blast furnaces, two experienced open-hearth operators have worked out a system (p. 82) for building up open-hearth bottoms or subhearths by fitting together large carefully machined blocks with joints staggered for extra protection. Block cross section is on the order of 15 x 28 inches, and lengths 12-18 feet, or sufficient to span the hearth. They are set on a layer of insulation and are covered by conventional cold-rammed magnesite to form the normal contour of the bottom and banks.

BENDING IS SMOOTHER—To reduce friction and minimize galling on the slide blocks of a new tube bender, an overlay of bronze ¼-inch thick was applied to the gibs on the slide blocks for both clamping jaws and forming die. The machine is designed to bend tubing from 1-inch 18-gage to 4-inch 12-gage and is fully automatic plus being capable of bending radii on both round and flat tubing. The overlay was applied by using 3/16-inch electrodes for a build-up of ¼-inch, 25 pounds of electrodes being required to cover the two ways on each block. Welding time on each piece was about 10 hours and thickness of the overlay after machining was ⅛-inch. Friction, of course, is reduced because of the dissimilar metals involved, bronze working against hardened steel.

—A.H.A.

Metalworking Outlook—p. 35 *Market Outlook—p. 117*

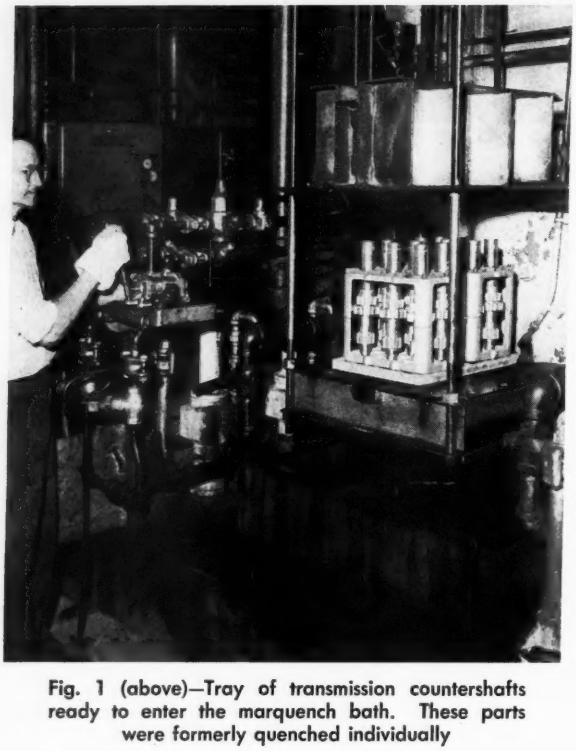


Fig. 1 (above)—Tray of transmission countershafts ready to enter the marquench bath. These parts were formerly quenched individually

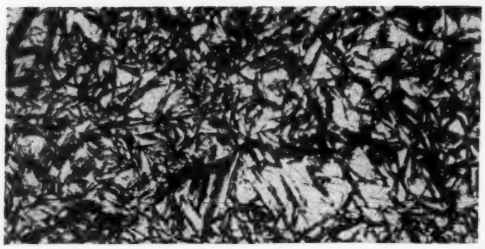


Fig. 2 (above)—Photomicrograph taken from a tooth of first speed countershaft gear carburized at 1700°F and quenched in 400°F oil. After cooling for 4 hours to room temperature, the gear was washed and tempered at 300°F for 1½ hours

Fig. 3 (below)—Photomicrograph of a conventionally quenched gear shown for comparison of structure

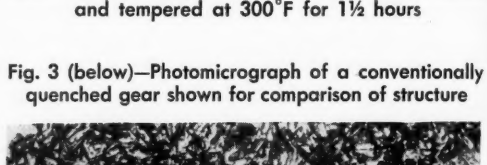
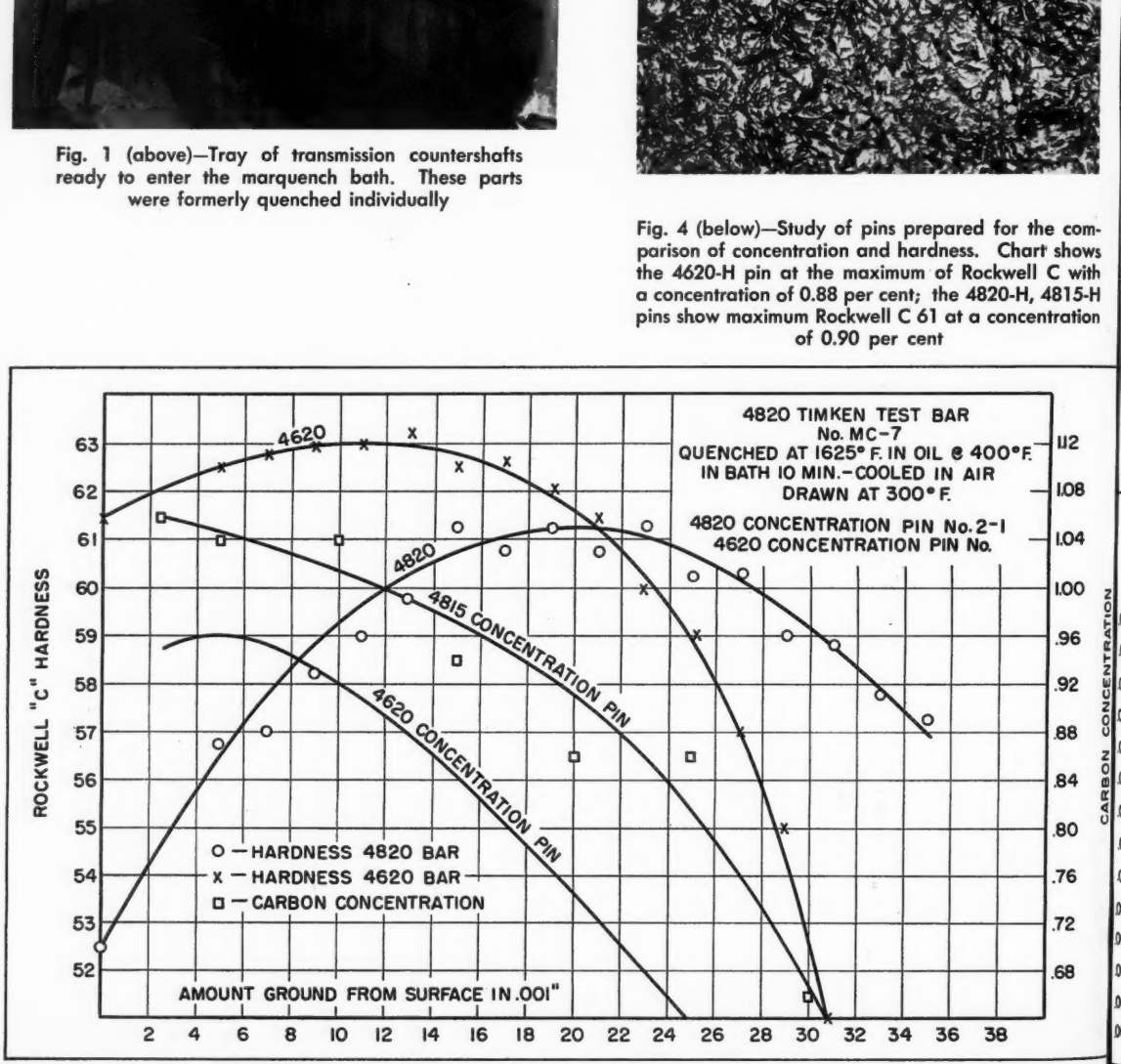


Fig. 4 (below)—Study of pins prepared for the comparison of concentration and hardness. Chart shows the 4620-H pin at the maximum of Rockwell C with a concentration of 0.88 per cent; the 4820-H, 4815-H pins show maximum Rockwell C 61 at a concentration of 0.90 per cent



MASS MARQUENCHING

Speeds Gear Output

By W. B. CHENEY
Assistant Works Metallurgist
and
W. C. HIATT
Assistant General Foreman, Heat Treat
International Harvester Co.
Ft. Wayne, Ind.

POSSIBILITIES of mass marquenching are being exploited by International Harvester Co. in its $1 million rearranged and modernized heat treating facilities at the Ft. Wayne Works. Five radiant tube gas carburizers are used to mass marquench transmission gears, differential side gears, side pinion gears, king pins and miscellaneous shafts.

Marquenching is a coined word for a process that uses a type of interrupted quench. Since oil is used as quenching medium at 400° F, temperature is not adjusted to M_s point for types of steel processed.

Factors governing this process are furnace temperature, carbon concentration, agitation of quenching medium, time cycle in quenching medium and transformation period. These factors properly controlled result in a superior product due to less quenching stresses and distortion. Some of the results: More production; elimination of dies and of plugs for splined bores; no individual handling; greater alloy life; increased load-carrying capacity and longer life of gears due to less residual stress.

Variables Closely Controlled—Development work on this process was conducted on a Quench-Master, a flexible machine that permits close control of the quenching medium and of the many variables in agitation. It was found that we were able to quench gears within specified tolerances, eliminating the use of quenching presses, plugs and special fixtures.

From our findings on individually handled parts in this machine, it was realized that mass quenching had possibilities if agitation and tank design could be improved. With this in view, a special study of tank design and agitation was conducted which resulted in our present technique.

Marquenching produced gears with a minimum of residual stress, thereby increasing their service life from 100 to 200 per cent and increasing the load-carrying capacity from 15 to 20 per cent as determined by dynamometer testing.

Transmission gears and parts were released for production on December 7, 1948. Since that time other parts have been studied, tested and released for production. There are approximately 75 different parts being processed which range in weight from ½ to 12 pounds, with solid sections from ½ to 2½ inches. This variation in weight, size and design of parts presented numerous problems to establish proper quenching as well as an economical production flow.

Furnace Atmosphere and Cycle—The process is in operation on five radiant tube carburizers. These furnaces are the two-row continuous type, containing 21 trays per row on which the work is automatically charged into the furnace.

The atmosphere in these furnaces consists of RX

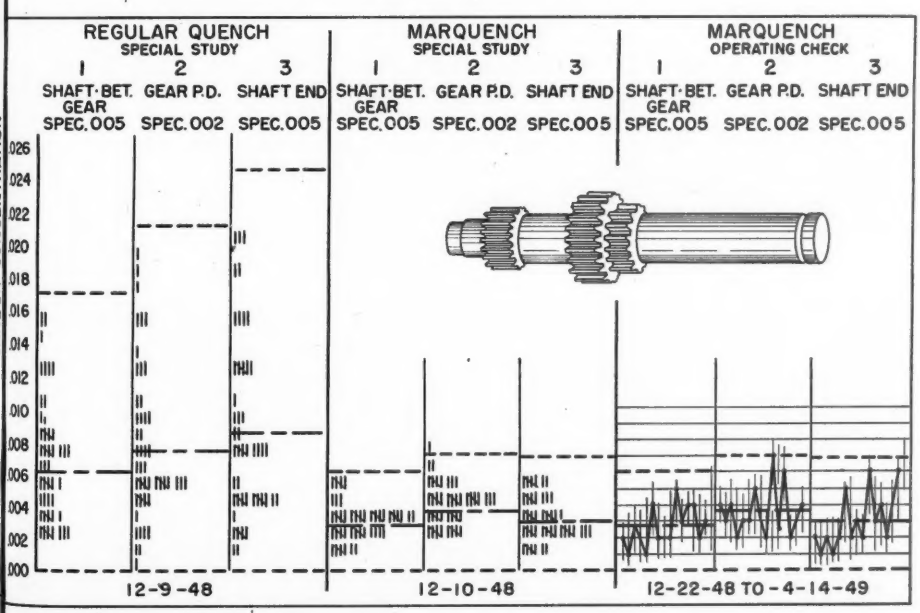


Fig. 5 — Transmission countershaft distortion comparison between the conventional and marquenched taken at three points on the steel shaft

gas as a carrier and 1050 Btu as an activator. Our ratio in relation to this process is 1250 cu ft RX to 35 cu ft of natural which changes approximately 1.3 times per hour. The atmosphere is checked regularly and plotted on quality control charts. Another interesting phase of this process and close atmosphere control is the increase in alloy life. We now have very light trays which have in excess of 8000 hours.

Furnaces are operated in cycle according to one of three specified case depths: 0.025-0.035, 0.031-0.047, or 0.047-0.063-inch.

Carbon Concentrated—This close control results in the concentration of carbon which we consider optimum for hardness and structure, believing that better load-carrying and wearing characteristics were obtained. Former practice was to hold the carbon concentration in the range of 1.10 to 1.20 per cent on all types of carburized parts. However, an extensive study was conducted on hardness, wear and structure, which proved that a lower concentration is desirable. Fig. 4 shows a study of pins prepared for the comparison of concentration and hardness. Seven cuts, 0.0015-inch on a side, were taken to arrive at the concentration curves, while the hardened pins were wet ground in 0.002-inch steps to arrive at the Rockwell C hardness. It will be noted that the chart shows the 4620-H pin at the maximum of Rockwell C 63 with a concentration of 0.88 per cent and the 4820-H, 4815-H pins show maximum Rockwell C 61 at a concentration of 0.90 per cent. We are attempting to hold furnace concentration between 0.85 and 0.95 per cent.

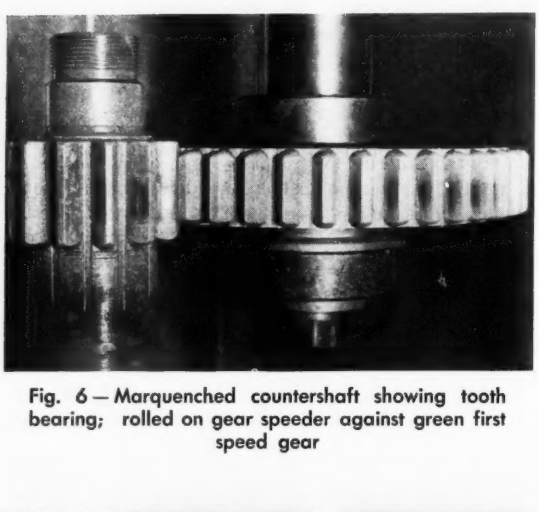


Fig. 6 — Marquenched countershaft showing tooth bearing; rolled on gear speeder against green first speed gear

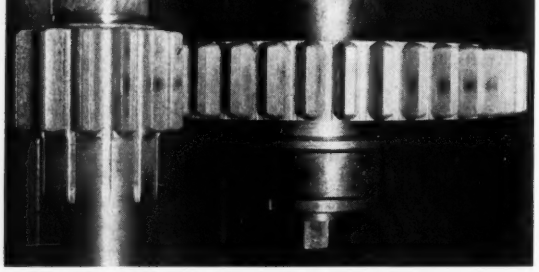


Fig. 7—Marquenched first speed gear showing tooth bearing; rolled on gear speeder against green countershaft gear; the first speed gear is crown shaved. Before marquenching the countershaft gear was individually tube quenched and the sliding gear die quenched

1600-Gallon Quench Tank—The 1600-gallon Harvester-designed quench tank is located directly under the side discharge door so that the material discharged to the Lowerator is submerged into the 400° F oil. The tank is designed so that the flow of oil is greatest at the submerged work level. Work on the Lowerator is automatically time quenched.

The oil bath is held at 400° F ±2° F by six radiant tubes which may heat or cool as required. A study was made as to the best location of the thermocouple to control the bath, and it was found that directly beneath the submerged work level gave the close control desired.

When the work returns from the oil, it is removed from the Lowerator to a roller conveyor where it is transferred to mesh baskets. Parts are held in the baskets until the transformation is completed before washing and tempering. This phase prevents a problem as some parts require as much as 5 hours for completion of the transformation. Therefore, there is a bank of material between furnace and washer.

When sufficient time has elapsed for the transformation, the baskets are placed on a power-driven roller conveyor that passes through the wash and temper units. All marquenched parts are tempered 1½ hours at 300° F. The conveyor is extended beyond the temper unit for 30 feet to allow the parts to cool and to be inspected.

Case Structure Martensitic—A fine martensitic case structure is obtained by this process. The photomicrograph, Fig. 2, is taken from a tooth of first speed countershaft gear carburized at 1700° F and quenched in 400° F oil. After cooling for 4 hours to room temperature, the gear was washed and tempered at 300° F for 1½ hours. This gear is made from 4820-H material with the following analysis: Carbon 0.21, manganese 0.76, nickel 3.45, chromium 0.08, silicon 0.23, and molybdenum 0.25. Hardness on the surface of the teeth was Rockwell C 60.5 with the core hardness at the pitch line, root line, and ⅛-inch below the root, 43, 38, 38 respectively. A photomicrograph of a conventionally quenched gear is shown for comparison of structure, Fig. 3.

Distortion and Quality Control—Throughout the study and development of the process, quality control has been an indispensable method in releasing parts for production. The benefit from this process is not in correcting errors in tolerances, but rather in holding stress to a minimum. In establishing this process on different parts, samples were checked in the green and spotted throughout regular production runs for gathering data.

From data presented by the authors at the SAE annual meeting, Detroit, Jan. 8-12.

STRAIGHT-FLOW MATERIALS HANDLING

Simplifies Integrated Operation

For the production of lubrication equipment, Stewart-Warner incorporates all forming, finishing, and other necessary operations into one closely-knit continuous operational sequence

By DAN REEBEL
Associate Editor, STEEL

COMPLETE control of all stages of fabrication, finishing, assembly, packing and shipping of Alemite lubricating units and accessories is secured with operation of its own completely integrated plant by the Alemite Division of Stewart-Warner Corp., Chicago.

Many innovations are found in this scientifically laid out facility capable of producing several carloads of finished equipment daily. Some of these include: Power conveyor movement of work-in-progress, use of centralized lubrication wherever possible, electronic inspection procedures, infra-red drying of surface finishes and straight-line material flow throughout the complete operational sequence. Raw materials enter in the same area from which finished products are shipped out; either truck or railroad freight cars are utilized.

Representing almost a decade of planning, the plant—today it produces Stewart-Warner's Atomic line of lubrication equipment—handles the fabrication and surface finishing of the units' covers and structural frames and the final assembly. Other component parts such as pumps, swivels, valves, etc., are produced by their other plants in the area.

All the necessary power shears, press brakes, punch presses, all types of welders, sanders and polishing lathes are available to handle the complete gamut of fabrication required.

Permits Inventory Reduction — Shearing facilities available enable the company's purchasing department to buy steel in mill sizes, thereby reducing inventory of various sized materials as 5 or 6 different sizes can be made from single sheets. This eliminates possibility of bottlenecks and reliance on outside sources for specific sizes.

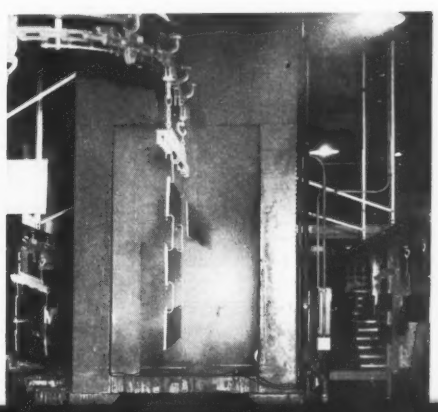
Material movement throughout the plant is established by predetermined schedules and so regulated to affect a continuous flow at all times.

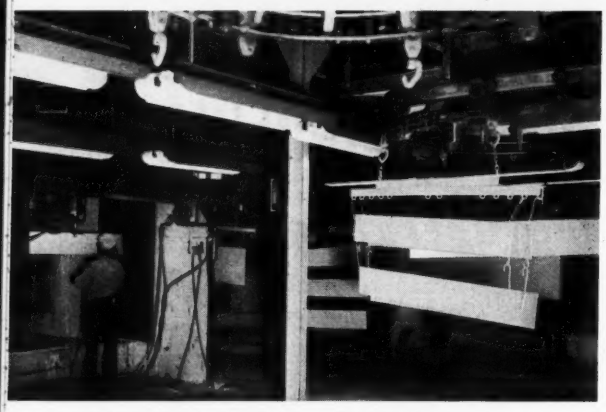
After shearing to size, material goes through the punch press line or the press brake line, whichever sequence of operations is indicated for the part being fabricated. All components to be subsequently used in the subassembly area are produced in this section.

When subassemblies are to be finished, they are removed from a temporary storage area (the removal enables proper flow of work through the surface finishing area and to the assembly area) and loaded on a 1158-foot continuous overhead chain conveyor that travels 8 feet a minute through a three-stage cleaning unit, overhead drying oven, prime spray booth,

Pressures up to 350 tons can be secured from the presses in this battery used to blank, draw, form and trim raw material into covers that are used for Alemite lubricating equipment

Component parts are "jet" propelled through washing, rinsing, and acid etching operations as powerful streams of boiling hot water and cleaning solutions provide clean metal surfaces for painting





Pressurized area shows parts receiving spray coats. Components move by conveyor

prime baking oven, finished spray booth and finished baking oven to the unloading area. Complete circuit of conveyor requires about 2 hours, 25 minutes.

Pressurized Painting Chamber—A totally enclosed, pressurized room contains the actual painting section. Filtered and temperature-controlled air is distributed at the rate of 75,000 cfm into the pressurized spraying chambers, insuring a healthful and dirt-free work area. Overhead baking ovens (infra-red heat) operate at temperatures ranging from 325 to 650° F, and are heated by Burdett gas-fired burners. Facilities for masking and dipping are available if such operations are required. A versatile paint distributing arrangement (located in an adjoining structure) can provide spray booth with eight different paints to as many operators. Paint is circulated continuously through this system by one of the company's Alemite Versatal pumping arrangements.

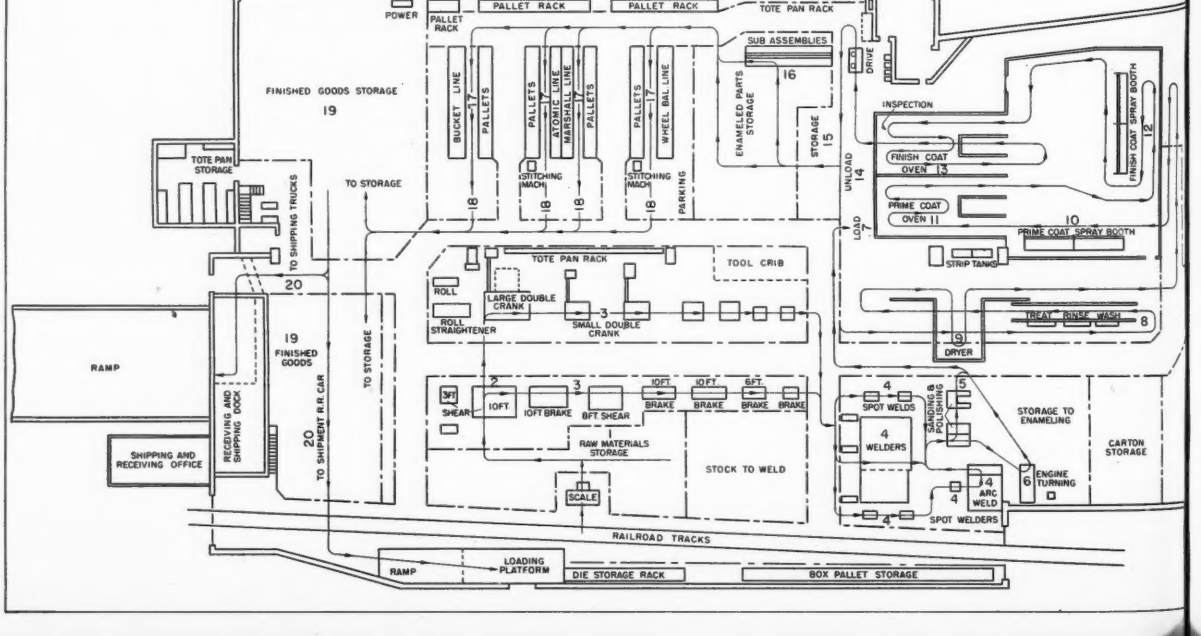
The three-stage cleaning cycle consists of a one-minute spray with an acid-phosphate cleaner at 160-180° F; a hot water spray rinse for 45 seconds at the same temperature, and a 45-second spray with a 140-160° F rinse containing an acid neutralizer to impart a rust preventive coating on the material. Next, material is dried in an overhead oven for about 4 minutes at 340° F. It then enters the pressurized finishing room. If dip-coating is specified, parts are removed from the conveyor, dip-coated and returned to the conveyor just before entering into the finish baking oven. They by-pass primer-spray booths, primer baking oven and finished spray booths.

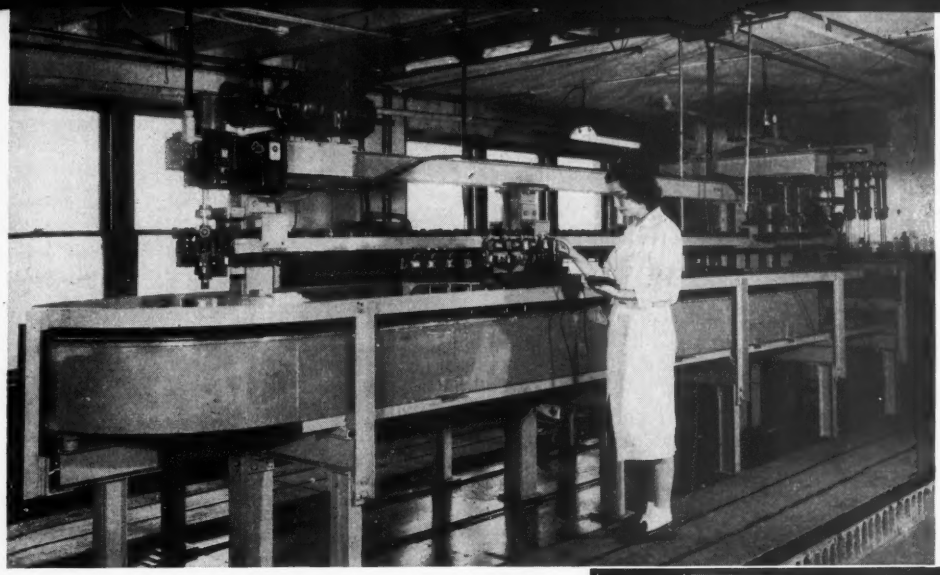
Painting Sequence — Prime coat is manually sprayed-on in two 15-foot-long water-curtained booths set end-to-end, each equipped with two spray stations. Next, the primer coat is baked for 10 minutes at 315° F in an overhead oven. It is followed by a finish coat of enamel manually applied in two 15-foot long water-curtained booths set end-to-end, each equipped with two spray stations. Next, the finished coat is baked for 10 minutes at 310° F in an overhead oven. From this point material returns to floor level, leaves the pressurized room and moves to the unload area for inspection and removal from the conveyor.

Parts not requiring any further assembly are packed and loaded on pallets to await shipment. Other material is palletized and transported to the assembly area. Here it is inspected, assembled, packed in cartons, again palletized and moved by fork truck to the finished goods area from where it is shipped.

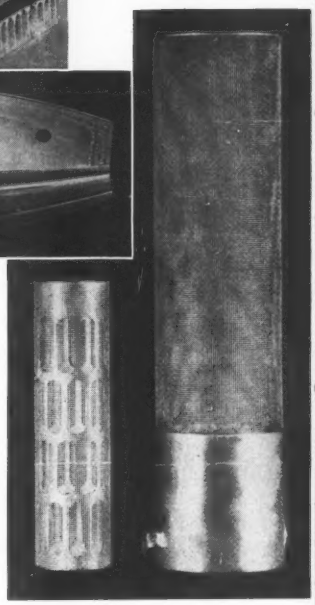
One of the many quality control measures in use at this plant are sensitive GE electronic gages for checking thickness of the paint coat. They can measure to within one-quarter of a thousandth (0.00025) of an inch. Full thickness of the finish at all points —with no weak or thin spots—is thus easily assured.

Plant plan shows the flow of materials and subassemblies besides the placement of various pieces of processing and finishing equipment





View of pilot plant for electroforming fountain pen caps at the Battelle Memorial Institute



Above — Razor case made of nickel electroformed over plastic base

Right — Sieve and filter made from copper-nickel electroformed screen. This Lektromesh screen produced by C. O. Jelliff Mfg. Co. is built up as a one-piece solid metal product by electrodeposition

ELECTROFORMING

—A Mass-Production Tool

"Cold casting" produces annually $100 million worth of products ranging from fountain pen caps to jet engine motor mounts. Tough design problems on intricately shaped metal parts are being solved successfully by improved electroforming techniques

ELECTROFORMING is being successfully applied to a variety of metal forming jobs. Actual applications have advanced this relatively new method to the point where it should be considered when deciding on the best method or process to manufacture a particular metal product. The process, also known as "cold casting" has simplified many design problems, primarily in small lot precision jobs.

Improved techniques now permit its use on a mass production scale to allow freer design and cheaper production of many articles. Several hundred plants are producing regularly scheduled electroforms, valued at more than $100 million per year.[1] Products made in whole or in part by electroforming are supplied to such industries as automobile, aircraft, radio, radar, glass, printing, rubber tire, and steel.

Metal on Mandrel—Electroforming is a process in which a comparatively thick layer of metal is deposited by electroplating on a mandrel or matrix which can then be removed so that a self-supporting shell or formed article is produced. In this process, electrodeposition goes beyond its common function of merely providing a protective coating and becomes a metal forming or fabricating process applicable to the production of many intricately shaped articles that cannot be formed as efficiently and accurately by other methods.

Some of the articles produced by electroforming cannot be made by other methods. Most electroforms, though, are so produced because they can be made with equivalent or better quality at lower cost. Electrodeposition and stripping procedures are adaptable to continuous and automatic processes involving little, if any, costly hand labor and they may frequently be substituted for a number of tedious manual machining and joining operations. Electroformed shapes of uniform strength eliminate the need for brazed or welded joints in many cases.

For tube-like or cup-like shapes, electroforming methods are particularly valuable since repeated drawing and annealing operations can be avoided. Metallurgical control of properties for electroformed metal is rapidly becoming an exact science, and future developments in electrochemical-metallurgical

know-how are certain to be significant to industry.

Copper, silver, iron and other metals can be and are electroformed. Nickel, because of its hardness, tarnish-resistance and other properties has been widely used in production work. Electroforming with alternate layers of two metals, such as copper and nickel, has been claimed in certain instances to provide advantages over either of the single metals.

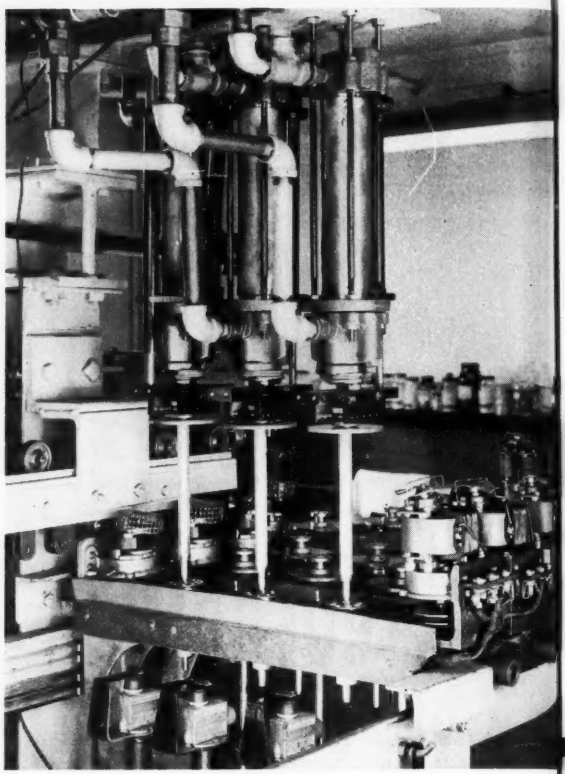
Physical Properties Good—Nickel for electroforming can be deposited with a hardness of 150-425 Brinell with corresponding ductility values of 30-6 per cent, respectively, in 2 inches, and tensile strengths of 51,000 to 152,000 psi. Table I shows physical properties of various electroformed deposits and baths for producing them based on data from International Nickel Co.[2] Some electroformers utilize laminated layers of nickel-iron-nickel. Compared with the other two metals, electroformed copper is relatively stress-free but has lower strength and hardness properties. Table II was prepared by Battelle Memorial Institute to give the physical properties of the metals most widely used in electroforming. These values indicate properties obtainable in the "as plated" state.

Since the thickness of electroforms must usually be several times that of electroplates, baths and operating conditions efficacious for high-speed deposition rates are preferred. Nickel baths, for example, are sometimes operated at current densities around 200 amp per sq ft (0.01-inch per hour), which is seldom reached in decorative plating. Methods and rates of agitation can be chosen so that high current densities can be applied.

It is understandable that smooth deposits are more difficult to obtain for thick electroforms than for thin decorative plates. Those who have produced electroformed articles have demonstrated repeatedly that acceptable smoothness can be obtained for thicknesses up to ¼-inch. Careful control is, of course, necessary. Filtration methods and rates used may seem fantastic to many job platers, but they have been shown to be both practical and economical.

Minimizes Dirt Infiltration—Designs for tank and agitation equipment to minimize the effect of dirt precipitated from the air should be evaluated for their effects if air filtration is not possible. Fluid flow should be directed so as to minimize dirt contact with the work until the dirt either drops below the work or enters the filter lines. The solution below the work should be uniformly drained from the bottom of the tank or allowed to remain stagnant. Chips from moving machine parts (gears, chains, brushes, commutators, etc.) must not be allowed to enter the electrolyte, or to collect on surfaces adjacent to the bath.

Metal fabricators generally think of electroforming as limited in wall thickness to a fraction of an inch, but electrodeposition can reproduce significant surfaces with only a few thousandths-inch wall, which can be subsequently built up by casting, brazing, welding, metal-spraying or sputtering to the desired thickness of the finished article. Thickness uniformity is very important and is generally controlled more accurately than in commercial decorative plating. Special techniques which are frequently employed include the use of (1) conforming anodes, (2) bipolar electrodes, (3) current-insulating shields, and (4) current robbers. Because conforming anodes from soluble metals are difficult to maintain, they are made almost exclusively from insoluble materials. Alloy lead is used in both copper and nickel baths.



Above—Closeup of the Battelle stripping station for electroformed caps

Right—This 70-pound jet engine motor mount was electroformed of nickel. Courtesy Bone Engineering Co.

Two Kinds of Mandrels — Electroforming differs from electroplating chiefly with respect to the adhesion of the deposited metal to its base. With few exceptions, electroforms must be started on a base of preformed shape but must be readily separable therefrom, after deposition is complete, or during an intermediate stage. The starting forms are referred

to most frequently as mandrels, molds, patterns, cores, impressions, and formers.

Two kinds of mandrels are in use: Temporary, which are destroyed as to form each time, and permanent, which are removed intact. Shape of the electroformed part generally determines which mandrel to use. Temporary mandrels are made of low-melting metals, waxes, metals like aluminum and zinc die castings which are dissolved out of the electroform, synthetic resins, and plastics. Many of these can be melted out and formed repeatedly. Permanent mandrels are made of chromium-plated hard steel, stainless steel, aluminum, and nickel.

No Inside Machining—The advantages of electroforming are greatest where external or internal dimensions require a great amount of machining, or where complex shapes require expensive and elaborate machining. Electroformed parts are not limited in wall dimensions as are regular castings which are difficult or impossible to cast with very thin walls. When electroforming, the thinner the wall thickness, the more economical the operation; yet the strength of one-piece construction is achieved. In addition, electroformed parts reproduce in detail the surface of the mandrel.

If a microfinish surface is desired on a complex interior section it can be obtained by finishing the outside surface of the pattern to the desired degree of smoothness. By electroforming on this surface, the necessity for all complicated inside machining is eliminated.

Metal Screens Electroformed—A unique development made possible by electroforming is the manufacture of metal screens by plating copper or nickel or copper-nickel as a one-piece, solid metal product wholly by electrodeposition.[4] No woven or other foundation structure is included in the process, operated by C. O. Jelliff Mfg. Co. The metal screen made by electroforming is known under the trade name Lektromesh. It presents a smooth surface and is easily fabricated by stamping, forming, soldering, and similar processes.

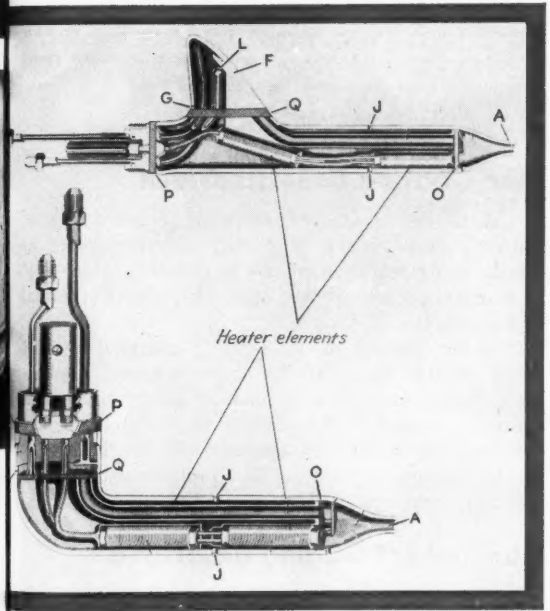
The plane rigidity of the material is most advantageous, particularly in formed cylinders and die cut strainers. In many cases it is possible to eliminate all bindings and supporting materials. Another special feature is the latitude in design. The design need not be held to standard counts, but the openings and locations of the openings can be constructed to suit specific needs. The screen is produced in nickel, copper and copper-nickel; it is reported that the copper-nickel screen offers an exceptionally wide range of possibilities because of its corrosion resistance and its mechanical properties.

This screen consists of a core of plated copper entirely surrounded by plated nickel. The ratio of copper to nickel can be varied. Generally, the electroformed screen is used in the fine meshes beyond the limits of perforated metals.

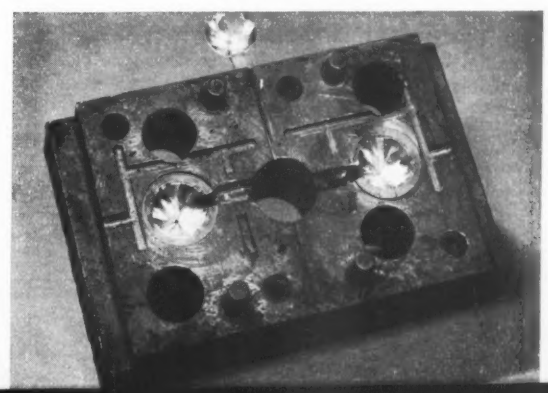
During World War II, considerable work was carried out in the production of precisely dimensioned radar wave guides. Only through electroforming was it found practical to achieve the close internal dimensions and smooth shapes of the complex shapes involved.[5] It is reported that dimensional tolerances of 0.0001-inch were common and several times a tolerance of 0.00005-inch was met. The finish was required to be less than 4 microinches.

Cold Cast Reflectors—Another electroforming application is the fabrication of searchlight reflectors.[5] In this case nickel and copper are deposited upon a master glass mold made conductive with a film of silver. When the shell is electroformed to the desired thickness, it is separated from the mold, the silver is removed and the nickel surface is plated with a flash of rhodium, 30 millionths of an inch thick, for reflectivity. Reflector signs for road warnings are an applied application.

Assembly of component parts has been accom-



Above—Pitot static tube. The assembly was imbedded in a low melting alloy to form a mandrel around which the cover was electroformed to join the barriers into air-tight compartments. The alloy is melted out through holes at A, J and G by heating in an oil bath at 600°F. Photo courtesy of Kollsman Instrument Co.



Right—Electroformed nickel cavity for casting plastic diamond shapes

TABLE I
PLATING SOLUTIONS FOR ELECTROFORMING AND PHYSICAL PROPERTIES OF DEPOSITS

Nickel

	Soft	Medium	Hard
Nickel sulfate	44 oz/gal	.....	24 oz/gal
Nickel chloride	6 oz/gal	40 oz/gal	.....
Ammonium chloride	.....	.....	3.3 oz/gal
Boric acid	5 oz/gal	4 oz/gal	4.0 oz/gal
Temperature	115-140° F	140° F	110-140° F
Current density	25-100 amp/ sq ft	25-100 amp/ sq ft	25-50 amp/ sq ft

Copper

Copper sulfate (crystals)	27 oz/gal
Sulfuric acid	65 oz/gal
Temperature	75-120° F
Current density (average)	15-40 amp/ Sq ft

Physical Properties of Deposits

	Hardness (Vickers)	Ductility (Percent elongation in 2 in.)	Tensile psi
Copper	80	22	36,000
Iron	240	15	50,000
Soft nickel	140-160	30	51,000
Medium nickel	230-260	21	98,000
Hard nickel	350-475	6	150,000

Iron

Ferric chloride	50 oz/gal
Calcium chloride	25 oz/gal
pH	6 to 10
Temperature	185-195° F
Current density (average)	50-100 amp/ sq ft

Based on data collected by International Nickel Co.

TABLE II
PROPERTIES OF VARIOUS ELECTROFORMED METALS

Metal	Hardness Brinell or Vickers	Tensile Strength psi	Elongation per cent*
Nickel			
Hard, stress-free as-formed	130–500	Up to 132,000	Up to 20
Very hard as-formed	400–575	Up to 160,000	Up to 9
Very hard stress-annealed	300–400	Up to 90,000	Up to 30
Fully annealed, re-crystallized	No data	45,000 to 55,000	Up to 50
Copper			
Stress-free as-formed	30–120	30,000 to 68,000	5 to 20
Cold-worked, ductile	65	Up to 102,300	40
Iron			
Stressed as-formed	225–350	50,000 to 110,000	5 to 20
Annealed	140–165	40,00 to 55,000	27 to 40
Cobalt			
As-formed	150–375	No data	No data
Silver			
As-formed	50–300	No data	No data

* Reported in most cases as elongation in two inches.
Based on Data Reported by Battelle Memorial Institute

plished in the electroforming of pitot static tubes.[6] In this case, it is necessary that the separate air pressure compartments be assembled to contain resistance heaters and tubing. The silver soldered skeleton containing the tubing, heaters and barriers O, P and Q has cast around it a mandrel of low melting alloy of lead-bismuth eutectic. The mandrel with the edge of the barriers exposed is then plated with the copper until the shell is thick enough (0.075-inch) to have the necessary structural strength. The alloy is melted out through holes at A, J and G by heating in an oil bath at 600°F. The outer surface is then ground, polished, and nickel plated. This technique involves a unique method of assembly which would be extremely impractical by other means.

Dies and Cavities — Electroforming is being used for the production of molds for casting plastics. Electroformed nickel injection-molding cavities for plastics offer many advantages over conventional methods, including the following listed by International Nickel Co.[3]:

1. Fine interior finish at no extra cost, as the finish of the male mandrel controls the cavity finish.
2. Very close inside accuracy.
3. Indefinitely high production from one hob or mandrel. In normal hobbing methods, the mandrel is damaged or destroyed by wear.
4. Exact uniformity from one cavity to another.
5. Use of expensive hobs can be avoided by electroforming on wax or plaster models.
6. Nickel cavities are resistant to corrosion during idle periods or to attack by lubricants during molding.
7. Shapes impossible to hob are feasible by electroforming and the parting line can be eliminated in some cases.

Electroforming is also applicable to extrusion dies with very small apertures, where fine interior finishes are desired. It is reported that hard chromium facings can be put on where necessary, even in hole openings as small as 0.001-inch.

REFERENCES

1. Safranek, W. H., Dahle, F. B., and Faust, C. L., *Plating*, p. 39 (Jan. 1948).
2. Prine, W. H., *Product Engineering* (Dec. 1948); Wesley, W. A. and Prine, W. H., "Practical Nickel Plating". A technical pamphlet published by International Nickel Co. Also Wesley, W. A., Monthly Review Am. Electroplaters' Soc. (Aug. 1938).
3. "Nickel Topics". A technical publication of International Nickel Co. (May 1950).
4. Based on information supplied by C. O. Jelliff Mfg. Co., Southport, Conn.
5. Prine, W. H., *Product Engineering* (Dec. 1948).
6. Kasdan, A. S., Proc. Am. Electroplaters' Soc. (1947).

Zinc Coating Benefits Given

Said to be capable of replacing other types of plating and having a high corrosion resistance as well as being readily available is Zincilate, a one-coat anticorrosion coating developed by Industrial Metal Protectives Inc., Dayton 8, O.

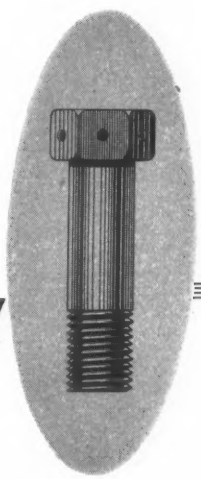
It is the subject of an 8-page illustrated booklet which details many of its characteristics, applications, formulations and methods of application. Advantages claimed include ability to withstand severe abrasion, application by conventional brush, dip or spray methods, self-healing and replacement of more expensive coatings.

Noncontact Gaging Described

Noncontact method of measuring cold rolled strip thicknesses from 0.005 to 0.1196-inch as it passes through cold mill operations is provided by an x-ray thickness gage developed by Westinghouse Electric Corp., Pittsburgh. This type of equipment is described in an 8-page booklet, DB 404-100, available from the company, P. O. Box 2099, Pittsburgh 30. It presents a basic theory of the gage, block-diagramming its electrical circuits to explain its operation. Operator's control, gaging unit, and indicator unit are described and electrical and mechanical specifications are given.

Chandler

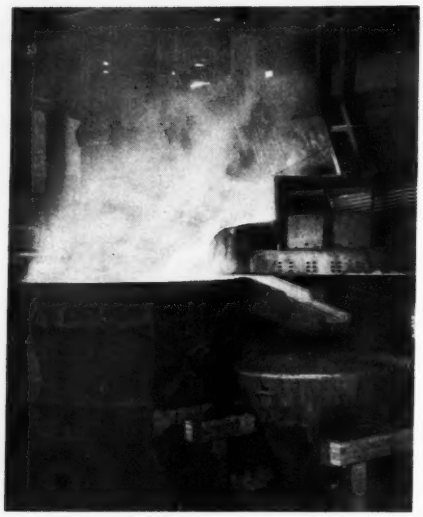
cold wrought
engineered products
faithfully do the
work they are
designed to do.....
the exacting job of
holding manufactured
things together.



CHANDLER PRODUCTS CORP.
1491 CHARDON RD. CLEVELAND 17, OHIO

CARBON BLOCK Proposed for OPEN-HEARTH BOTTOMS

Subhearth lining of machined carbon blocks affords extra protection against furnace breakouts. Original installation savings range from $3000 to $5000



Tapping a 150-ton heat of basic steel

FURNACE breakouts, historically a nemesis to open-hearth operators, may become a thing of the past with the development of recent new ideas on the use of carbon in open-hearth furnaces.

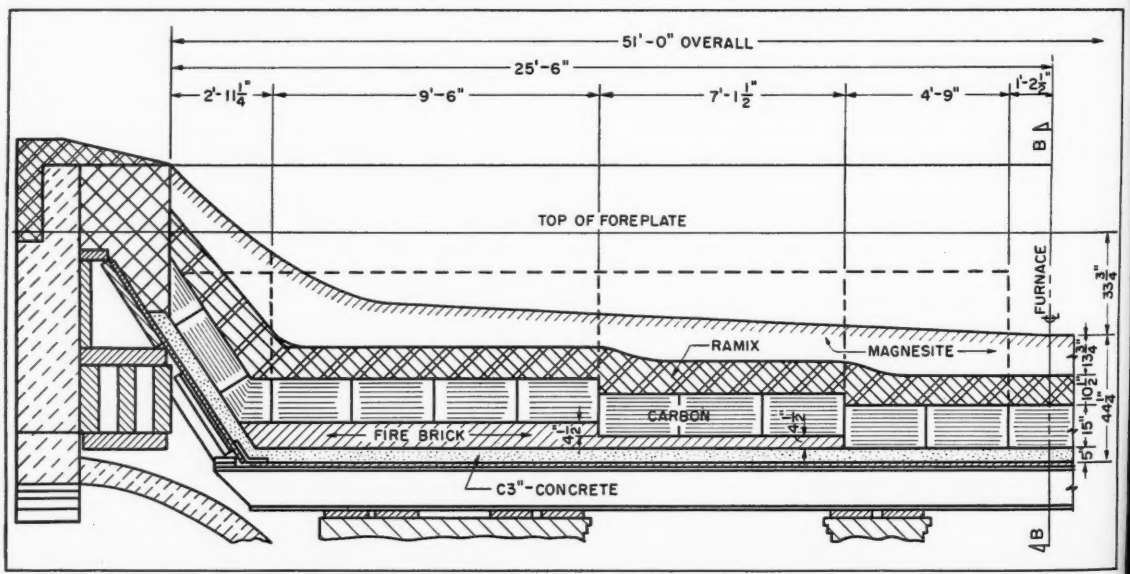
Widely used as a blast furnace refractory in this country and abroad, carbon is now being given favorable consideration by people responsible for our steel-making furnaces. Because of its light weight, about one-half that of chrome-magnesite, or magnesite brick, and its high melting point, around 5000° F, carbon seems to be readily adaptable to the subhearth structure of open-hearth furnaces.

Carbon blocks 15 inches thick and 28 to 31 inches wide, can be furnished in lengths to span furnace hearth dimensions from 12 to 18 feet, and are laid on a 5 to 8-inch insulation layer covering the steel pan on the bottom.

The front and back banks as well as the ends of the furnace subhearth are made of carbon blocks 11¾ inches thick by width and length measurements to suit the particular furnace design.

For a Tight Fit—All blocks are machined to give a tight fit; a dowel pin running the length of the adjacent blocks gives a staggered joint for extra protection in case molten metal breaks through the wearing surface of the hearth to the carbon subhearth. If desired the carbon can be electrically wired to an alarm system that will alert personnel if contact is made between the molten bath and the carbon subhearth. Because of its high melting point and its resistance to load or spalling, the carbon lining will

Elevation of basic open hearth showing location of carbon block

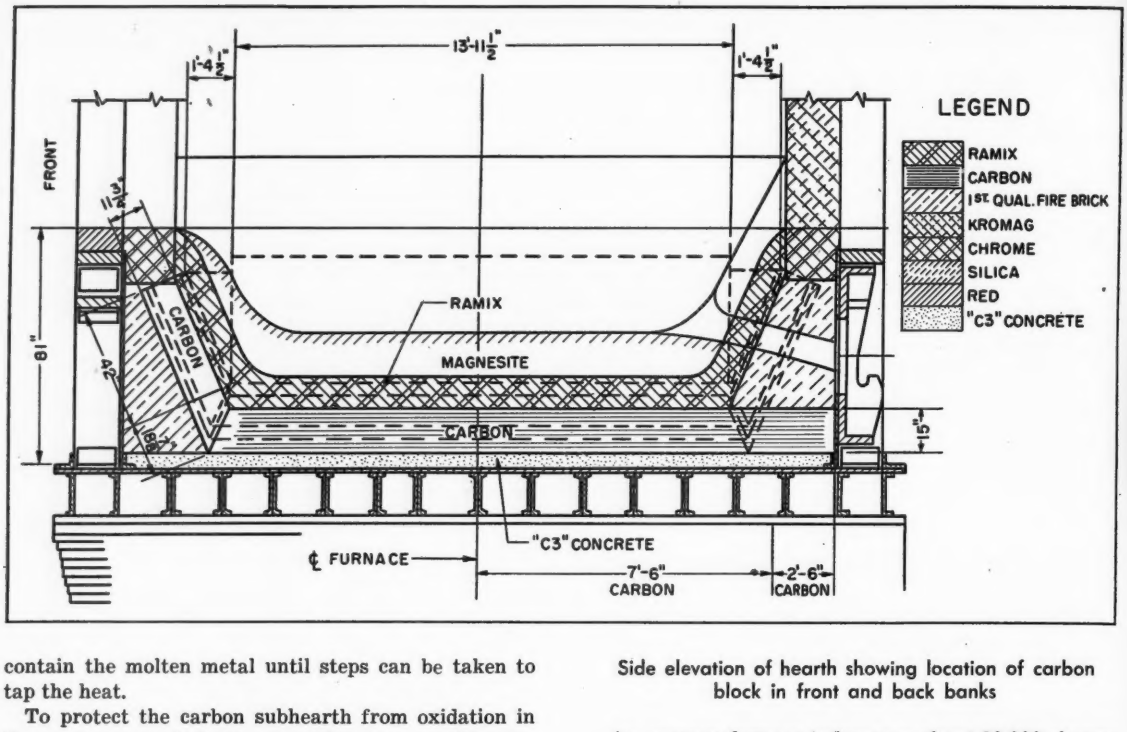


Merged for better service to you

Two substantial leaders in service to the metals industry throughout the free world . . . Edgar E. Brosius Company, Inc. and Salem Engineering Company, have now joined hands in order to be of greater service to their customers. The large and capable consulting and industrial furnace designing staff of Salem is now immeasurably strengthened by the mechanical equipment manufacturing capacity of Brosius, whereas, the blast furnace and steel plant machinery designers at Brosius have many brilliant new partners to assist them. So apropos is this merger of talent that you can now call upon new Salem-Brosius, Inc. with complete confidence whether your needs include the smallest of furnaces or the construction of the largest plant projects.

SALEM-BROSIUS, INC., Pittsburgh 15, Pa.

Affiliates: Brosius Division, Pittsburgh 15, Pa.; Salem Engineering Division, Salem, Ohio; Salem Engineering Co., Ltd., Milford nr. Derby, England; Salem Engineering (Canada) Ltd., Toronto, Canada



Side elevation of hearth showing location of carbon block in front and back banks

contain the molten metal until steps can be taken to tap the heat.

To protect the carbon subhearth from oxidation in the warm-up period of a new furnace, a cold ramming magnesite bottom material is used to form the normal contour of the bottom and banks. The completed furnace hearth can then be brought up to any thickness desired by the use of either the cold-rammed or burnt-in magnesite material.

An average furnace today uses about 20,000 chrome magnesite or magnesite brick for the subhearth while the carbon replacement is less than 75 pieces. Designed bottoms to date, with the present cost of materials and labor show an original installation savings of from $3000 to $5000.

Coking Coal Tests Compared

Cokemaking qualities of three high volatile coals and eight blends of different rank coals, using both the standard Bureau of Mines—American Gas Association and the slot oven methods are described in bulletin 480, available from U. S. Government Printing Office, Washington 25, D. C., for 20 cents.

Results obtained at specified temperatures in the standardized sheet steel cylindrical retorts are compared with those obtained in an experimental flat oven designed to stimulate commercial coke oven operation. The bulletin describes the methods and coals used in the experiment and includes photographs of cokes made in each type of apparatus from the various coals and blends. It also contains graphs and tables on the yields of coke, gas, tar light oil and ammonium sulphate.

Tungsten Electrodes Operate Cooler

Use of higher currents on any given size electrodes is permitted through the use of Thor-Tung thoriated tungsten electrodes, said to operate cooler than standard tungsten electrodes. A development of Air Reduction Co., New York, and available as a non-consumable electrode for Heliwelding, the company's inert-gas-shielded arc welding process, the electrode is being widely used in direct current straight polarity welding.

It is said to have good arc stability, both at the high and low current ranges. Because it runs cooler and does not become molten, its consumption is said to be almost negligible and contamination resulting from accidental or deliberate touching is eliminated. Because of its permanency, the new electrode may be pointed to permit continued operation at extremely low current.

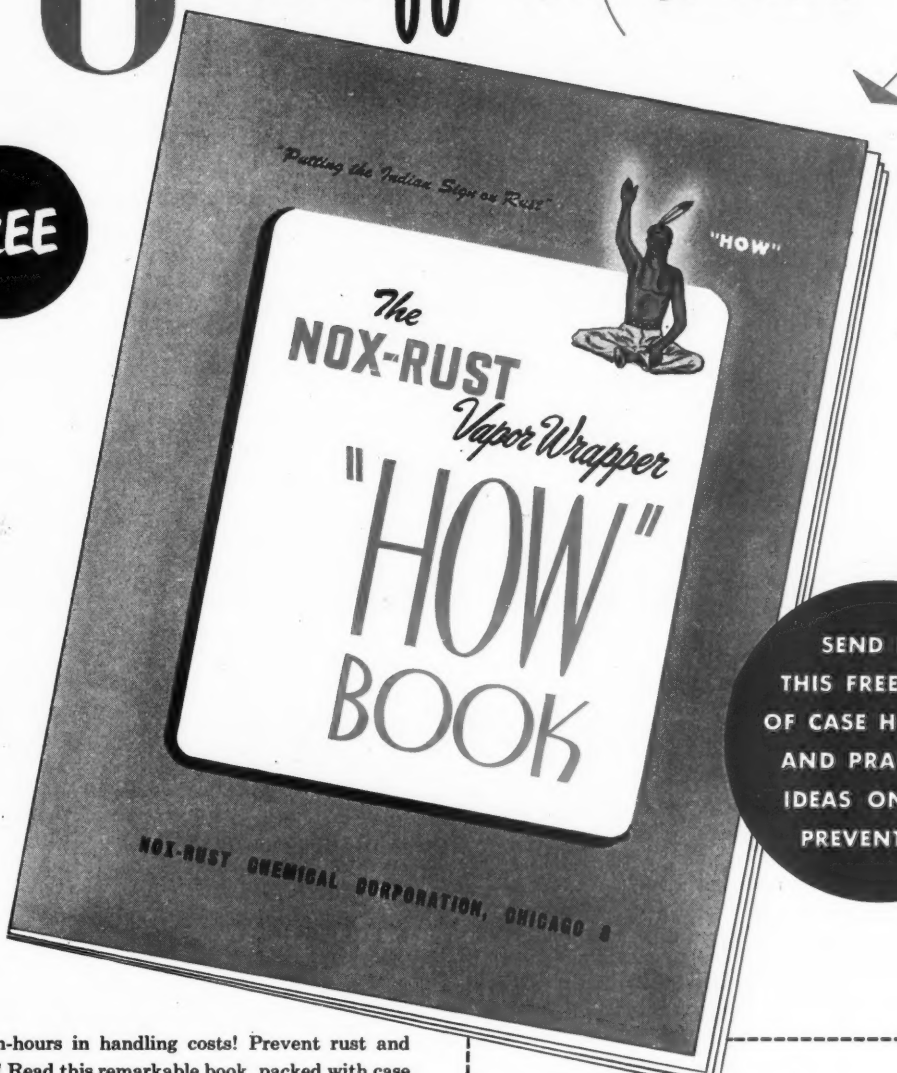
Office Doors Shot Together

Spot welding torch of the Heliarc type was used to weld filler strip into the space around the single window in the doors, flush edges and hinges used in the United Nations skyscraper in New York. Atlantic Metals Product Co., Long Island City, N. Y., fabricators of the doors, said that this spot welding method has cut welding time approximately two-thirds.

Process also is stated to have saved time in finishing as the welds were clean. All welds were made from one side without backing and took 2½ seconds each. They were made in thin-gage cold-rolled steel.

Just off the Press

FREE



SEND FOR THIS FREE BOOK OF CASE HISTORIES AND PRACTICAL IDEAS ON RUST PREVENTION

Save man-hours in handling costs! Prevent rust and corrosion! Read this remarkable book, packed with case histories. See how firms like International Harvester, Caterpillar Tractor and many others cut costs with the new NOX-RUST VAPOR WRAPPER. Read about this new method of packaging that delivers parts and equipment *FACTORY FRESH!* Send for your free copy of the new VAPOR WRAPPER BOOK today.

FREE! FOLDER LISTING RUST-PREVENTIVES CONFORMING TO GOVERNMENT SPECIFICATIONS. FREE ON REQUEST.

NOX-RUST CHEMICAL CORPORATION
"Industry's Rust-Prevention Headquarters"
2451 SOUTH HALSTED STREET—CHICAGO, ILLINOIS
DETROIT—BALTIMORE—SAN FRANCISCO

NOX-RUST CHEMICAL CORPORATION
2451 South Halsted Street
Chicago, Illinois

Please send your free book to

NAME_____

COMPANY NAME_____

ADDRESS_____

CITY_____ STATE_____

A LIGHT PULL AND YOU GO!

High power ability does it . . . the instant surge of power you get in a battery-electric truck that's Exide-Ironclad equipped. And it's finger-tip-control power . . . meets *all* demands in *stop-and-go, lift-and-shift* operations . . . plus split-second handling, easy maneuvering, accurate spotting. Exide-Ironclad Batteries also give you:

ROUND-THE-CLOCK PERFORMANCE—no mechanical troubles, no unscheduled down time.

UNIFORM SPEED straight through to end of shift.

LOW OPERATING COSTS—on the average of 4c an hour for power . . . batteries absorb a very high percentage of charging current.

LOW MAINTENANCE COSTS—seldom more than 15 cents per shift.

EXCEPTIONALLY LONG LIFE—proved on more than 100,000 heavy-duty jobs.

INHERENT SAFETY—freedom from the hazards of fire, fumes, noise and uncleanliness.

There are Exide-Ironclad Batteries for every size and make of battery electric truck.

Write for your FREE copy of the new Exide-Ironclad Battery Motive-Power Catalog, Form 5161.

THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia 32
Exide Batteries of Canada, Limited, Toronto
"Exide-Ironclad" *Reg. Trade-mark U. S. Pat. Off.*

1888 . . . DEPENDABLE BATTERIES FOR 63 YEARS . . . 1951

Movies Record Blast Furnace Combustion Turbulence

Movie technique employed to study movement of solids under action of blast. Model simulates blast furnace action

WHAT takes place in the combustion zone of a blast furnace is now being studied through the medium of high-speed motion pictures. The investigation has not been carried far enough to permit drawing conclusions but the results are encouraging.

The interesting research was described by Dr. J. B. Austen, director of research, United States Steel Corp., Kearny, N. J., before the Blast Furnace and Coke Association of the Chicago District at the Del Prado Hotel, Chicago, Jan. 26. Pointing out that complex things go on in the blast furnace, the speaker said the high-speed movie technique was hit upon as a means of obtaining some knowledge on the subject.

2000 Frames per Second—The movies were taken through the tuyeres of No. 2 Edgar Thomson furnace. Certain modifications of the tuyere peep sight were necessary to permit use of the camera. The pictures are taken at a speed of 2000 frames per second, which is the equivalent of exposing 100 feet of film in 2 seconds. For viewing purposes, the film is projected on the screen at normal speed. The movement of solids, principally coke, in the turbulence of the blast is plainly visible. Through use of an iron rod or probe inserted through the tuyere, the investigators determined that the camera sees into the furnace a distance of about 32 inches.

Based on the findings in the film, United States Steel researchers constructed a model in which furnace action can be simulated. The model consists of a box with 4 foot square plate glass sides placed about 8 inches apart. The box is filled with ¾-inch oak blocks which have a density about the same as coke; 90 per cent of the blocks being cubes and 10 per cent double cubes. When air blast is admitted through a tuyere in the lower left-hand side of the box the blocks assume a counterclockwise circular movement not unlike that depicted in the high-speed movie. In the model, air velocity can be measured precisely and the movement of the blocks correlated to the velocity.

Dr. Austen stated the investigation gives promise of producing valuable information on what takes place inside the blast furnace. He stated that work is continuing but at a slowed-down pace. Today's high demand for blast furnace hot metal does not permit operating the test furnace under varying conditions of blast and burden.

Sintering Machine Described—The world's largest sintering machine was described in a paper authored by W. J. Urban, engineer, American Ore Reclamation Co., Chicago, and presented by A. A. Nelson of the same company. This machine, now being installed in Blackwell, Okla., at the plant of the Blackwell Zinc Co., subsidiary of American Metal Co., is 12 feet wide and 168 feet long over the wind boxes. It has a hearth area of 2016 square feet, which is about 3 1/3 times that of a 6-foot machine.

The machine is designed to produce 2 tons of sinter per square foot of hearth per day. It was stated by the author that the saving in production cost will be $0.18 per ton as compared with three 6-foot machines. Termed a 16 wind box machine, it actually has 32 boxes. Description centered chiefly around type pallets employed and expansion characteristics.

Gas Cleaning a Must—Air pollution abatement at blast furnace and steel plants was discussed interestingly by Dr. C. A. Bishop, research associate, United States Steel Co., Pittsburgh. He pointed out that Allegheny county, Pa., has had an air pollution ordinance for 1½ years, making smoke and fume abatement obligatory. New blast furnaces must have gas cleaning equipment installed. The ordinary dust catcher gets most of the dust, but stacks producing ferromanganese introduce problems which require special treatment.

Dr. Bishop described a sonic method which has been tried to treat ferromanganese dust but it has not proved economical. The method employs sound from a siren concentrated in a pipe to agglomerate dust particles. Difficulty is that the particles agglomerate to such size that they stick and are not easily removed from the pipe. Furthermore, the agglomeration requires that the gas be retained in the pipe at least 3 seconds and a retention of this duration interrupts gas flow unduly.

Best method thus far developed is use of a plate precipitator. Ferromanganese dust particles oxidize; consequently the dust is collected and mulled with water, then briquetted to almond size. These briquets are burned in a steam generating plant.

Slips Studied—Studies are being made of slips in blast furnaces, for it is estimated that 5 per cent of the gas escapes during such period and this gas is laden with dust. In by-product coke plants, good housekeeping is the best means of minimizing dust.

The speaker was asked to comment on dust production in the open-hearth furnace when oxygen is employed to speed the heat. He presented a slide which showed that twice as much dust is generated during the oxygen cycle when oxygen is used as compared with the cycle without oxygen, but the total is not as great as in some early phases of the furnace heat.

In concluding his presentation, Dr. Bishop asserted that the technical aspects of dust removal are less important than the economic aspects.

Officers of the association announced that it will hold its annual meeting and golf tournament for members at Olympia Fields on June 8, and its golf tournament for members and guests there on Aug. 3.

Investment Casting Described

Manner in which the investment casting process is used to make substantial savings in machining, tooling, and elimination of waste metal is covered in a four-page folder published by Investment Casting Co., 319 Chestnut St., Newark 5, N. J. It describes which metals can be cast; a diagram illustrates case history to demonstrate potentialities of the process.

DANLY PRESSES

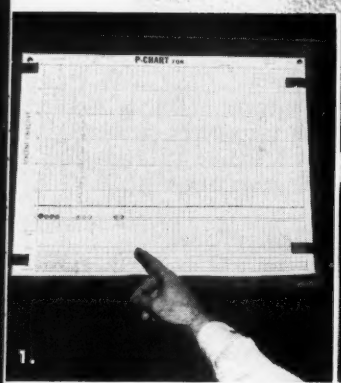
REQUIRE LESS MAINTENANCE...

... at International Harvester's East Moline works — where performance is a matter of careful record!

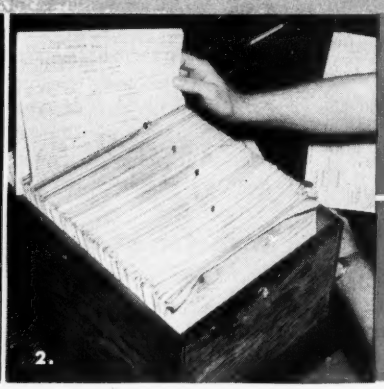
International Harvester Corn Picker

The 400-ton Danly Straight Side Press shown at right has required an amazingly small amount of maintenance work—an average of less than 2½ hours a week over the last twelve months. And a large portion of this time was consumed by routine press attention such as oiling and adjusting.

Write today for your copy of the Danly Straight Side Press Catalog and see how unique Danly Press construction and design features will achieve similar press operating cost reduction for you.



1.



2.

1. QUALITY CONTROL procedures are highly developed in the Harvester production system. Parts from every press are completely checked at least once each shift and with every die change. Charts like the one shown here hang at each machine station and provide a complete running record for statistical analysis purposes.

2. MAINTENANCE RECORDS are maintained separately for every machine, providing an exact and complete history of required repair work. Each card identifies the machine, shows its location and describes any special characteristics. Maintenance work is tabulated currently by job description, date and hours required.

STAMPING A VARIETY OF PRODUCTS on a steady production schedule is the job of this 400 ton Danly Straight Side Press. Here, a wagon elevator bottom for corn picker assembly is being formed at a rate of more than 1200 per eight hour shift. Operators like this Danly press because it is smooth and quiet, taking even top capacity jobs easily.

DANLY®

Mechanical Presses . . . 50 to 3000 tons

SEND FOR YOUR COPY TODAY!

DANLY MACHINE SPECIALTIES, INC.
2100 SOUTH LARAMIE AVENUE
CHICAGO 50, ILLINOIS

Spur Gears
by Horsburgh & Scott

● Spur Gears by Horsburgh & Scott are "steel muscled" with rims, arms and hubs extra heavy for the pitch. Unless otherwise specified, steel gears are made from .40 carbon steel which has a higher tensile strength and wears much longer than the commonly used .15-.20 carbon steel. These and many other features make H & S gears stand the "gaff" under heavy load conditions . . . giving long and uninterrupted service.

Send note on Company Letterhead for 488-Page Catalog '41

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 HAMILTON AVENUE • CLEVELAND 14, OHIO, U. S. A.

White Plans for Emergency

Service and parts operations of White Motor Co., Cleveland, are being mobilized to keep trucks and busses made by the company running during the emergency. White's preventive maintenance-parts conservation program was used as a national pattern by the Office of Defense Transportation in World War II.

Basic idea of the Emergency Service Corps plan started by White is to keep parts on hand in localities where they are needed, and registration of all the company's equipment in service is already underway. New vehicles bear an ESC dogtag listing serial and model numbers of chassis, engine, transmission, axles and other major parts and assemblies. Tags are being assigned to all trucks and busses now in service through the registration plan.

When the parts information plus other salient facts about the operation of each vehicle in service are cataloged, an inventory control system will be established at the Cleveland plant and integrated with all branches, distributors, dealers and service stations. A unit exchange system for complete engines, water pumps, starters and generators, distributors, etc., is an important part of the plan, enabling trucks to be kept on the move with minimum down time. Importance of the drivers is not overlooked and a drivers' manual is provided to make the driver more alert to safety and proper maintenance methods, especially in emergencies. These factors plus expanded and modernized distributor, dealer and truck service station facilities will assure owners of uniform servicing and maximum vehicle life, White officials believe.

Induction Regulators Added by GE

Growing industrial demand for regulated three-phase power at low voltages brought about the introduction of a new line of three-phase dry-type, induction voltage regulators by the Transformer & Allied Products Divisions, General Electric Co., Schenectady, N. Y. Included are both self-cooled and forced air-cooled regulators in standard 10 per cent and 20 per cent (raise and lower) ranges of regulation.

They are offered in ratings from 120 to 600 volts and from 12 to 85-kva. Three-phase, dry-type ratings have been available in these sizes in the Triplex assembly, which consists essentially of three single-phase regulators on a single base. The new arrangement of the three-phase winding on a single core makes possible

NOW READY FOR YOU —

New YALE Fluid-Drive GAS TRUCKS

Developed to peak efficiency in two years of intensive on-the-job testing

Here's proof that YALE gives more for your money!

Only YALE gives you fluid-drive for smooth, powerful operation—longer truck life:

Now you can get the same efficient power transmission used in expensive passenger cars. Smooth, *full* power at any speed—even fully loaded on ramps! No jerky stops and starts—you can work in closer quarters, cut down load breakage, reduce driver fatigue, save tires, *lengthen clutch life 3 to 6 times!*

Only YALE gives you this extra-power combination—hypoid gearing—65HP engine:

Here is a newly developed power team that can handle capacity loads, steep grades, heavy road shock day after day in any weather—and still stay on the job with an absolute minimum of "down time" for maintenance!

Only YALE gives you all these exclusive money-saving features:

Sealed automotive type hydraulic brakes give greater safety. Shockless steering provides easy "passenger car" control. Cold drawn, precision aligned uprights assure smooth, even lifting. *Every* vital part, in fact, has been designed and developed to give you *more truck for your money.*

Now, get your own on-the-job proof:

Now, when manpower, time and production are at a premium, is the time to see for yourself how much more this YALE gas fork truck can do for you. Write for all the facts today.

Capacities up to 10,000 pounds

THE YALE AND TOWNE MANUFACTURING CO.
Department No. 82
Roosevelt Boulevard & Haldeman Avenue
Philadelphia 15, Pa.

I am interested in cutting my materials handling costs.

_____ *Please have your local representative call on me.*

_____ *Please send me FREE detailed literature.*

Name_____

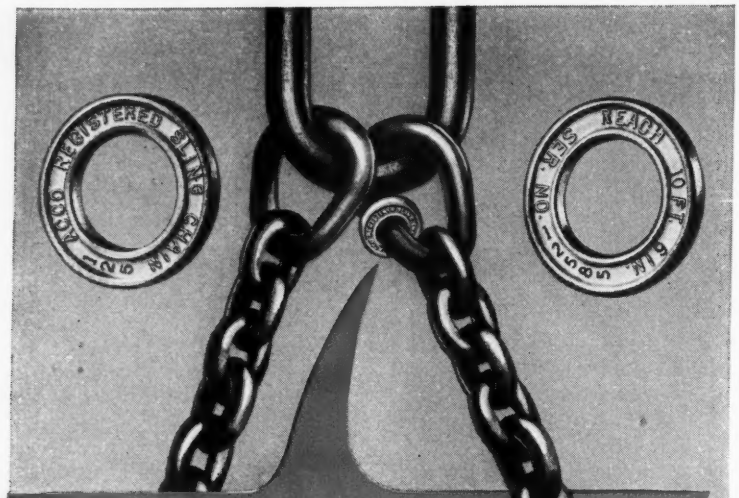
Company_____

Street_____

City_____ State_____

YALE

MATERIALS HANDLING DIVISION

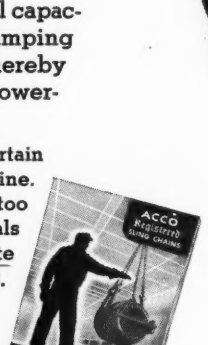


Positive Identification

on Every ACCO Registered SLING CHAIN

● This double-faced identification ring is a mark of safety. It stays put. It's always there to give you the necessary information. It enables you to use every ACCO *Registered* SLING CHAIN . . . safely . . . up to its full capacity. It eliminates necessity of stamping such information on the bull ring thereby damaging its metal structure and lowering its lifting capacity.

Don't Gamble . . Don't guess that a certain sling chain will lift an expensive machine. The damage to men and material is far too costly. Select the types, sizes and materials needed for your work from the complete line of ACCO *Registered* SLING CHAINS. The positive identification ring on each one gives you assurance that the unit was rigidly inspected and fully tested. You can't buy better sling chains.



Send for your copy of **Catalog DH-80.** *It shows you how to select, use, and care for sling chains.*

"Intentionally Better" SLING CHAINS

ACCO York, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.

AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

In Business for Your Safety

a saving for users in the ratings offered. The new design is not intended to entirely replace the Triplex assemblies. Some applications and ratings (especially the smaller sizes) lend themselves more readily to the Triplex than to the new design.

Lathe Gear Change Made Easy

A simplified quick change gear mechanism designed to save time and give long, dependable service is being supplied on 16-inch swing and 14½-inch swing lathes made by South Bend Lathe Works, South Bend, Ind. A minimum number of parts and ball and needle bearings reduce power requirements and increase sturdiness. A direct reading index chart shows positions in which the two tumbler levers are placed for each of 48 screw threads, 48 power longitudinal feeds and 48 power crossfeeds. There are no sliding clutches or sliding primary end gears to engage.

Standard screw threads from 8 to 224 per inch are obtained by shifting the two tumbler levers on the gear box. The stud gear is changed for an additional series of coarse pitches ranging from four to seven threads per inch. Provision is made for the use of special stud and intermediate gearing needed to cut metric screw threads, diametrical pitch worm threads or other special screw threads. Regular gear guards enclose the metric or other gearing without requiring additional guards.

Drums Refinished at High Speed

Used steel drums for companies shipping a variety of liquids are reconditioned at a rate of 330 to 360 per hour by Acme Steel Drum Co., Newark, N. J., despite many of them being delivered in a battered and rusted condition. To maintain this production rate, equipment and machinery must be tough and trouble-free.

First step is to wash all drums inside and out with a steam and caustic soda solution. Before the next step they must be drained and completely dried. Small portions of the cleaning solution remaining after the drums are drained are sucked out with a hose attached to a vacuum line. Several vacuum hose stations are serviced by a single Leiman vacuum pump operating at about 8 inches of vacuum. The excess solution does not pass through the pump but is trapped in reservoir tanks.

After being well dried the drums are straightened where needed, sandblasted, fitted with new tops and

Leaders OF INDUSTRY THE WORLD OVER

RELY ON F·E·I· *for...*

OPEN HEARTH FURNACES,

SOAKING PITS, regenerative an one-way recuperative,

CONTINUOUS REHEATING FURNACES, Bloom, Billet and Slab,

DIRECT FIRED ANNEALING FURNACES for Sheet, Coil, Tool Steel Bars, Wire, other products

GALVANIZING FURNACES for Tubes, Sheets and Metalware,

SALT DESCALING FURNACES for Stainless Steel Sheet, Bar, other products

And Other Complete Heating Lines

In America and abroad, F.E.I. is recognized for top performance. You can rely on Furnace Engineers' skill, based on over 30 years' experience, to provide the most advanced heating methods. F.E.I.'s patented, automatically controlled combustion system provides high metallurgical quality and faster, more economical operation. Remember, F.E.I. is the complete buy . . . from plan to production.

Write for Bulletin . . . Tell Us Your Problem

AMERICA:
Allegheny Ludlum Steel Co.
American Steel & Wire Co.
Armco Steel Corporation
Bethlehem Steel Company
Carnegie-Illinois Steel Corp.
Cleveland Wire Works (G.E.)
Consolidated Vultee Airc. Corp.
Continental Steel Company
Copperweld Steel Company
Crown Cork & Seal Company
Empire Steel Corporation
Follansbee Steel Company
Jones & Laughlin Steel Corp.
Hofmann Industries
Mercer Tube Company
Mesta Machine Company
National Tube Company
Niles Rolling Mill
Parkersburg Steel Company
Reeves Steel & Mfg. Co.
Revere Copper & Brass, Inc.
Rochester Can Company
Sharon Steel Corporation
Superior Sheet Steel Co.
Tennessee Coal, Iron & R.R. Co.
Valley Manufacturing Company
Vilsack Fisher Mfg. Co.
Wheeling Steel Corporation
Wickwire-Spencer (C.F.&I.)
Youngstown Sheet & Tube Co.

*CANADA:
Dominion Foundries & Steel Co.

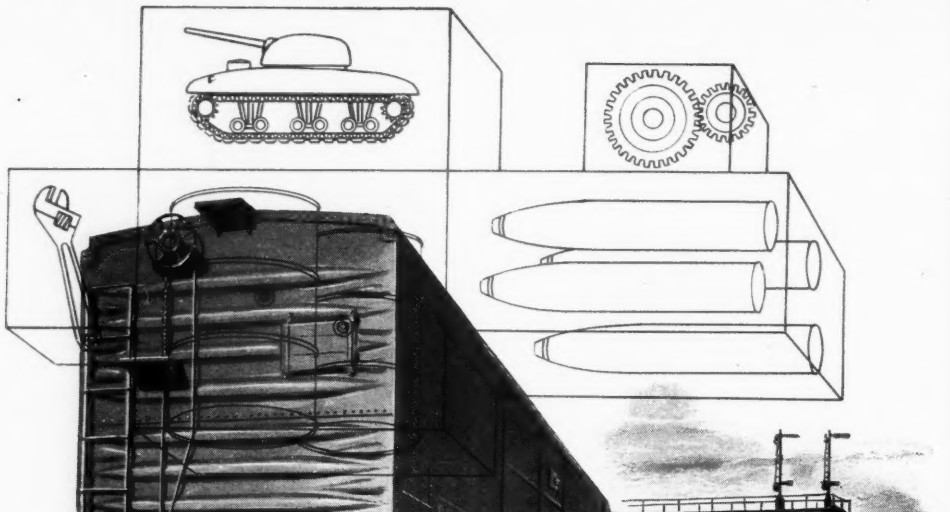
*ABROAD:
A.R.B.E.D. Co., Luxembourg
Beautor Cie., France
DeWendell Cie., France
Formeaux Cie., France
Messrs. Thomas Baldwin, Wales
South African I. & S. Co., S.A.
Steel Co. of Wales, Wales
Swindon Iron Works, England
Yawata Iron & Steel Co., Japan

*(List is incomplete and growing)

6

Furnace Engineers, Inc.

F. E. I. Building • 1551 West Liberty Avenue • Pittsburgh 16, Pa.



STEEL

THE VEHICLE OF DEFENSE

Without steel there would be little or no movement of men and material . . . there would be little or no defense.

Currently, the railroads of America, in order to fulfill their assigned responsibility in the gigantic program of national defense, have ordered $500,000,000 worth of freight cars—steel freight cars.

The steelmakers of America have responded in like manner, increasing facilities, stepping up production and allocating a predetermined portion of their total output to car foundries and car builders.

Weirton Steel Company, pledged to participate in defense measures in any way and to any required degree, is supplying a substantial part of its production for the program to increase America's freight car supply.

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

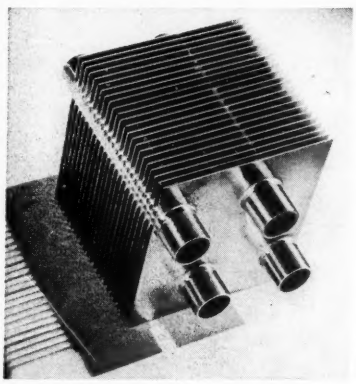
gaskets and the surfaces are painted. Some drums are given an interior coating for added protection. Conveyors carry the freshly painted drums through electric ovens for quick drying.

Screw Catalog Available

Two features of special importance and convenience to users of fasteners contained in the 1951 edition of Continental Screw Co.'s catalog are: 1. Every table of head dimensions lists both slotted heads and Phillips recessed heads. 2. The tapping screw section includes a tabulation in which all information is conveniently compiled in one place. The latter feature eliminates the inconvenience of searching for the information in widely separated tables as has been the case in many earlier publications.

Standard fasteners are treated with complete information in the 100-page illustrated catalog including head and thread dimensions, recommended uses, methods of applying, general data, finishes, packaging, weights, shipping, etc. Specials are thoroughly covered and illustrated and include special purpose screws made by the company such as Sems, Thred-Lock, Spin-Lock, Lock-Tite and others. Continental's

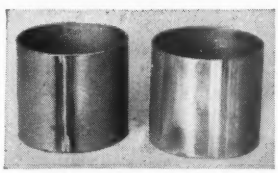
Bullets Bond Tubing to Fins



PURELY MECHANICAL bond with no welding or soldering is used in bonding these corrosion-proof heat exchange units for heating and air conditioning work by Trane Co., LaCrosse, Wis. Flat plate-type fins of stainless steel are stamped and belled, forming a bonding collar at each opening. A tool steel bullet is forced through the tube by compressed gas against the continuous surface formed by the collars of fins. To meet requirements involved in the process, Carpenter Steel Co., Union, N.J., supplied tubes to closer than standard tolerances

SINGLE GRINDING PASS gives smooth finish to shells of vertical electric motors.

800% faster weld removal with 3M Abrasive Belts!



LOOK AT THESE RESULTS

When Century Electric Company, Saint Louis, Missouri, installed the modern 3M Grinding Method, production of stator shells jumped from 15 to 125 pieces per hour. New backstand equipment and fast-cutting 3M Abrasive Belts eliminated one entire operation. Plus value: a smoother, more attractive finish on each seam.

Converting your present grinding and polishing equipment to this new system is easily done—and at a minimum cost. The 3M Representative in your locality will be glad to check your present finishing operations—point out ways to increase your production, cut your unit costs. Use the coupon below for free help on your grinding problems.

Minnesota Mining & Mfg. Co. S 251
Saint Paul 6, Minn.

Please send copy of
"Step Up Production" Booklet.

3M ABRASIVE BELTS

NAME_____

FIRM_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

Made in U.S.A. by MINNESOTA MINING & MFG. CO., St. Paul 6, Minn., also makers of "Scotch" Brand Pressure-sensitive Tapes, "Scotch" Sound Recording Tape, "Underseal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-Slip Surfacing, "3M" Adhesives.
General Export: Durex Abrasives Corp., New Rochelle, N.Y.
In Canada: Canadian Durex Abrasives Ltd., Brantford, Ontario.

NORTON
ABRASIVES
Abrasives - Grinding Wheels - Grinding and Lapping Machines - Refractories - Porous Mediums - Non-slip Floors - Boron Carbide Products - Labeling Machines

You'll Get Better Performance Out of These *5 Feature* Norton Mounted Wheels and Points

WHETHER you use mounted wheels and points by the dozen or by the thousands, you'll like the improved performance that you'll get from these Norton products. They are made by a *new process* in the *new* Norton grinding wheel plant.

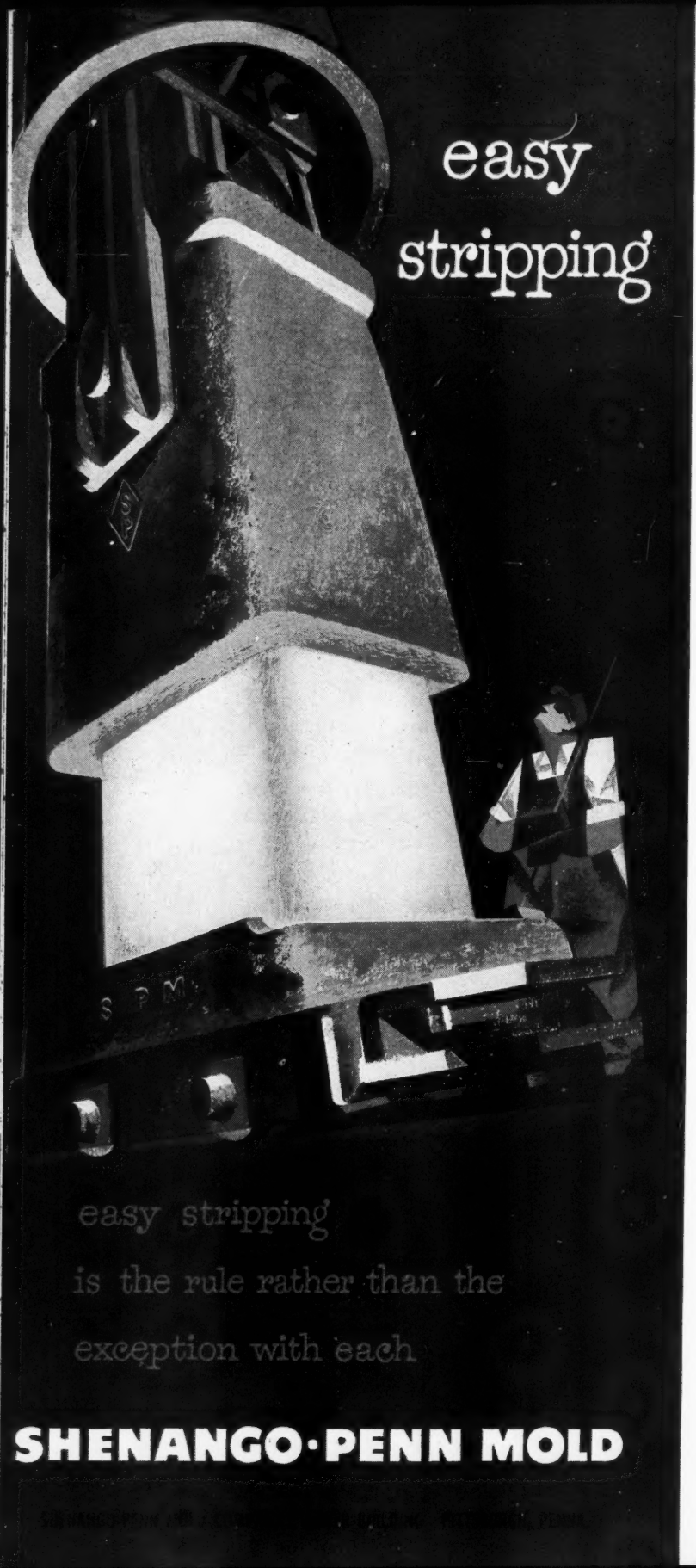
1. **They Cut Fast**—Norton mounted wheels go right to work cutting—and fast—because they receive a truing operation which removes the "mold skin" and leaves the wheel bristling with sharp points.
2. **They Hug the Work**—Norton wheels are absolutely concentric because they are trued on their own spindles. They run true and smooth with no tendency to bounce on the work.
3. **They are Vibrationless**—Perfect balance is especially important in these small wheels which run at terrific speeds. Inherent balance is built into Norton wheels by the new Norton manufacturing process.
4. **They have Long Life**—All grains in the wheel share equally in the job of cutting. None are wasted by vibration and pounding. None have to be trued away to obtain concentricity.
5. **They are Uniform**—Improved mixing methods, precision molding and electric firing produce wheels even more alike than the peas in a pod. You get the same performance from *every* wheel.

Whether you are using mounted points and wheels for the fine finishing of delicate dies and molds or for real stock removal on intricate castings, you'll like the improved performance that you'll get with Norton. Write for catalog—ask for Form 43-A4.

Making better products to make other products better

NORTON ABRASIVES

NORTON COMPANY, WORCESTER 6, MASS. · Warehouses in Five Cities · Distributors in All Principal Cities



newest products Hy-Pro insert bits, holders and hand drivers make their first appearance in the catalog. Engineering executives may secure the catalog by writing to: Continental Screw Co., New Bedford, Mass.

Nickel Silver for Rugged Gages

Nickel silver's properties of resistance to corrosion, fatigue and wear, relatively good electrical conductivity, ease of forming and fabrication and ability to take a high gloss are utilized by Rochester Mfg. Co., Rochester, N. Y., in a small but vital part to ensure long life and trouble-free operation for heavy duty pressure and vapor tension temperature gages.

Heavy duty pressure gages for diesel engines, farm and road machinery and similar applications must withstand mechanical vibration, overload and exposure to dust and moisture. To retain accuracy under this kind of abuse, the company specifies wear-resistant nickel silver for indicating pointer assemblies because it is simple in design, light weight and can be formed to critical dimensions. The 12 per cent nickel silver alloy (Riverside alloy 402) used in the Rochester pointer is specified as soft temper, giving not only the desired product properties but also permitting severe bending during fabrication with relatively few rejects and long die life.

Metallic Soaps Cataloged

Applications of Whittaker metallic soaps (stearates), aluminum, barium, calcium, magnesium, zinc and zinc palminate are described in the booklet being distributed by Whittaker, Clark & Daniels Inc., New York. Tables show the analysis, physical properties and solubility of each product. The booklet contains all the information necessary to select the proper metallic soap product.

Calculates at a Glance

Weights and lengths of strip metals in coils or straight lengths may be computed at a glance with a calculator available from Precision Steel Warehouse Inc., Chicago. Although it is designed so that basic calculations are for cold-rolled strip steel, a factor table is included enabling the user to find an answer for aluminum, brass, copper, magnesium, Monel and other metals.

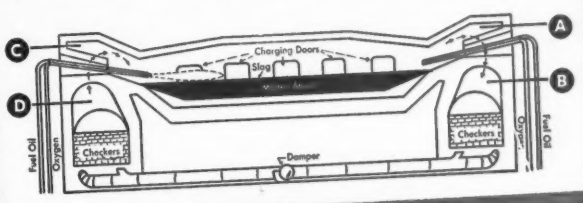
It can be used by engineers, estimators, purchasing agents, press room foremen, etc. Accurate answers are provided but operations are sim-

PRODUCTION BOOSTED

BY STRAIGHT ANSWERS FROM THIS REMARKABLE INSTRUMENT

"The way the Cities Service Heat Prover analyzed combustion atmospheres, we knew right off what to correct."
--Open Hearth Operator

Cities Service Heat Prover is applied at A and B—or C and D (on reverse cycle)



This highly developed flue gas analyzer gives correct reports on any type and size of furnace. Quickly, accurately and fully it lets you know how much fuel may be going to waste; whether there are combustibles, or excess oxygen to cause troubles like scaling; what combustion losses are due to useless heating of excess air. Corrections can then be made for added production efficiency. You can profit by this check-up service. Ask about arrangements.

For the Metal Fabricating Industry—
a complete line of petroleum products that includes:

Chillo Cutting Oils	**Pacemaker Hydraulic Oils**
Trojan Greases	**Optimus Cylinder Oils**
Trojan Gear Oils	**Q-T Quenching & Tempering Oils**
Pacemaker Compressor Oils	**Pacemaker Turbine Oils**

For complete details, mail coupon today and receive your copy of "Combustion Control for Industry."

...IT'S FREE

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

CITIES SERVICE OIL CO.
Sixty Wall Tower, Room 1000
New York 5, New York

Please send me, without obligation, a copy of "Combustion Control for Industry."

Name_____

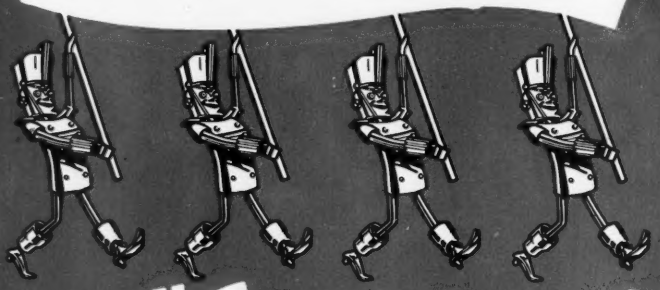
Company_____

Address_____

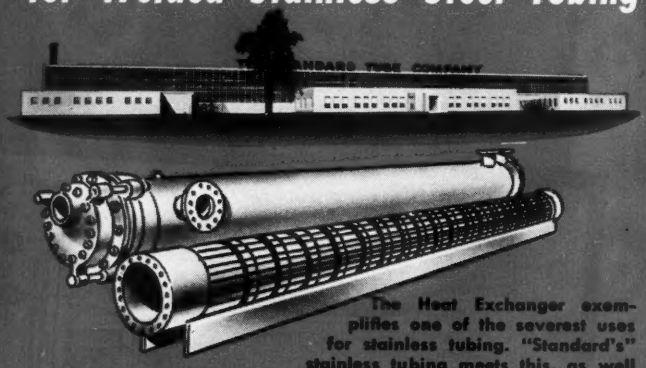
City_____ State_____

Keep in Step with—

RIGID GOVERNMENT TUBING REQUIREMENTS



SPECIFY "Standard" for Welded Stainless Steel Tubing



The Heat Exchanger exemplifies one of the severest uses for stainless tubing. "Standard's" stainless tubing meets this, as well as many other different requirements for strength, and heat and corrosion resistance.

Deal with the Specialist among Specialists

A tubing specialist, like other specialists, knows his trade best.

When you deal with "Standard" you deal with a tubing specialist who manufactures millions of feet of tubing every month from stainless and carbon steel—and for 25 years has been serving all types of industry for mechanical and pressure tubing applications.

If you need stainless tubing, be sure you specify "Standard". It pays to deal with the tubing specialist among specialists.

Stainless Tubing Size and Thickness
⅜" O.D. to 3" O.D.
.028 to .095 wall
Carbon Steel Tubing
½" O.D. to 5½" O.D.
.028 to .260 wall

plified so that a knowledge of higher mathematics is not required for its use. The calculators may be secured without cost by writing to the company at 4401-25 W. Kinzie St., Chicago 24.

Cobalt-Base Alloys Discussed

Two new cobalt-base alloys are described in a revision of the booklet "Haynes Alloys for High Temperature Service" published by Haynes Stellite Division, Union Carbide & Carbon Corp., Kokomo, Ind. The new alloys are known as Haynes alloys Nos. 25 and 36. Alloy No. 25 is a wrought material that has exceptional mechanical properties at temperatures up to 1800° F in the fully annealed condition without subsequent aging. This alloy is easy to fabricate because it has an average room temperature ductility of 55 per cent. No. 36 is a comparable cast version of No. 25 but has better creep and stress-rupture properties at elevated temperatures than any other Haynes cobalt-base alloy now commercially available. It is resistant to oxidizing and reducing temperatures up to 2100° F.

Hub Cap Clamps On

Exposed shaft or stud ends for either rotating or stationary assemb'ies in light applications can use a decorative Speed Nut hub cap and wheel retainer introduced by Tinnerman Products Inc., Cleveland. It is called a Cap Nut and replaces the usual hub cap, cotter pin and plain washer used on mobile toys and wheel goods like coaster wagons, scooters, supermarket carts and lawn furniture.

Since it is a one-piece assembly, application is easy and no special tools are needed. The Cap Nut is held firmly in place by six sharp points that bind into the axle or shaft and eliminates sharp edges found on cotter pins or shaft ends. Axle drilling for cotter pins is eliminated and its decorative value enhances the appearance of many products. Aluminum caps are used making available a variety of coatings and finishes. Two styles are produced: Derby for general use and Top Hat for greater shaft protrusions.

Car Shaker Bulletin Released

Description and construction features of the car shaker made by Allis-Chalmers Mfg. Co., Milwaukee, are contained in bulletin 07B7221A made available by the company. Specifications and a cross-section, through the

Simply clean surface

STEP 1

Simply apply dy✓chek Dye Penetrant *(by brush, spray, or dip)*

STEP 2

Simplified Non-Destructive Testing

Simply remove excess dye with dy✓chek Dye Remover

STEP 3

Simply apply dy✓chek Developer

STEP 4

New Way to INSPECT METALS

Save dollars... save time... and be sure!

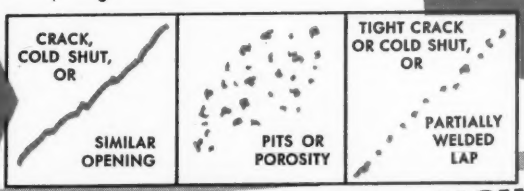
HERE ARE FACTS ON

dy✓chek TRADE-MARK

the dye penetrant inspection method

PATENT PENDING

AND... FLAWS ARE REVEALED



QUESTIONS AND ANSWERS

Q. What is Dy-Chek?

A. Dy-Chek is the revolutionary new dye penetrant method of inspection developed by *Northrop Aircraft Research.* It consists of three special liquid compounds easily applied by brush, spray, or dip.

Q. What does it do?

A. Dy-Chek reveals the location, extent, and nature of any flaw having a surface opening or discontinuity in any metal.

Q. What kind of metal surface can Dy-Chek inspect?

A. Any kind, magnetic or non-magnetic, including castings, forgings, machined parts, plate, sheet, tubing, pipe, and weldments.

Q. Are special lights required?

A. No lights, booths, electricity, or special installations are necessary.

Q. Is Dy-Chek inspection expensive?

A. Not at all. No fees or licensing is required—only the moderate cost of the special liquids. Dy-Chek materials cover large areas per gallon. Dye Remover is water-soluble, therefore water can be used freely in Step 3.

Q. Can Dy-Chek be used in the field, for preventive maintenance, as well as in a plant for manufacturing and receiving inspection?

A. Yes, the complete portability of Dy-Chek is one of its great advantages.

LEARN HOW the Dy-Chek method of non-destructive testing can save you time and money in your business. Ask for complete details today.

dy✓chek COMPANY

division of Northrop Aircraft, Inc.

1507 EAST BROADWAY
HAWTHORNE, CALIFORNIA

dy✓chek —*the dye penetrant inspection method*

Dy✓Chek Company
1507 East Broadway, Hawthorne, California

Send by return mail complete details on Dy-Chek, the Dye Penetrant Method of inspection for any metal.

Name_____ Title_____

Company_____

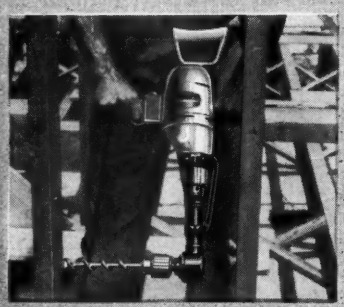
Address_____

City_____ Zone____ State_____

Have you a DRILLING problem that Van Dorn DRILLS can solve?

Here's how thousands of plants have used them to speed up jobs!

In MAINTENANCE—The versatile Van Dorn Drill Line gives you hard-working drills for maintenance as well as production. They drive twist drills, wood augers, Hole Saws. And their husky construction stands up under the beating maintenance tools usually take.



In CONSTRUCTION—Whether you're building or modernizing, Van Dorn Drills give you a wide selection. Big, rugged Drills for heavy-duty boring, like this Van Dorn ½" Heavy-Duty model with right angle attachment. Small, compact, ¼" models for drilling lead holes in building cabinets, putting up shelves, etc.

In PRODUCTION—Dependable speed, power, stamina, easy handling make Van Dorn Drills the top choice of thousands of production men. The powerful, compact, Van Dorn ¼" HOLGUN* shown here is a sample of the wide range of models and capacities you have to choose from.

WATCH a Van Dorn Drill on the job and you'll see speedy drilling, easy handling, trouble-free running. Examine its engineering and you'll find a powerful Van Dorn-built motor, tailored for the tool; full ball-bearing construction; extra-tough gears, shaft and chuck spindle and husky housing. Check the Van Dorn Drill Line and you'll discover an unmatched choice of 25 models in capacities from ¼" to 1¼" in steel, double in hardwood. A choice of handle arrangements for easiest operation. A choice of speed, power and price in most capacities.

That's why it makes sense to think of Van Dorn Drills first when you're up against a drilling problem. They'll save you time, money and man-hours. And as a *plus*, you get finest service for longer tool life from any one of 29 Van Dorn-owned-and-operated Factory Service Branches. See your nearby Van Dorn Distributor for thorough demonstrations. Write for free catalog to: THE VAN DORN ELECTRIC TOOL CO., 720 Joppa Road, Towson 4, Md.

For Power Specify "Van Dorn" Portable Electric TOOLS

(Div. of Black & Decker Mfg. Co.)

*Trade Mark Reg. U. S. Pat. Off.

vibrating mechanism are included. Savings in time and money plus elimination of dangers to operating personnel in steel mills, coke ovens, foundries and similar plants are listed as some of the advantageous features of the shaker.

Air Power Uses Explained

A variety of jobs being performed using air motors made by Bellows Co., Akron, are explained in bulletin CL-30.

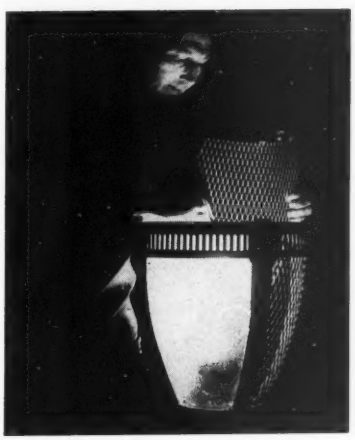
The company is using the bulletin to show how many jobs can be and are being done in a way that formerly seemed out of the range of air motors.

Construction features of the Bellows air motor are shown and an insert gives dimensions on various models available. Other features give details of presses and air-powered control devices that are made by the company.

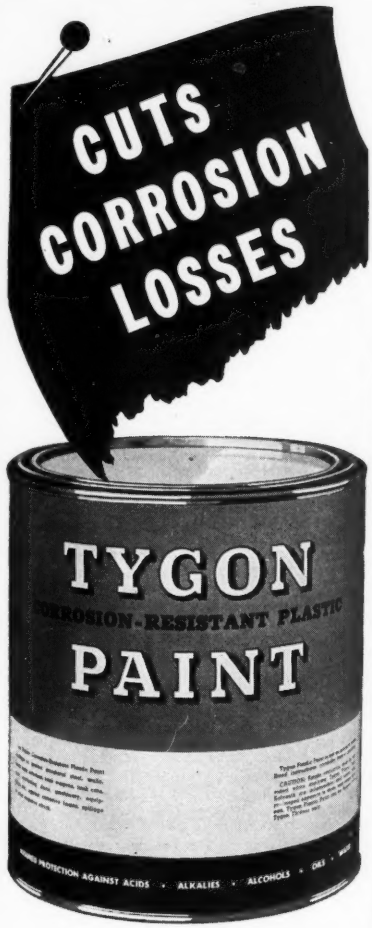
Collets, Pushers and Pads Listed

Benco Collet Mfg. Co., Cleveland, released a catalog featuring collets, pushers and pads plus illustrations of other new machine tool accessories. Lathes and milling machine makes are given together with the collet number which applies. A specification chart is also included.

Stoneproofing a Street Lamp



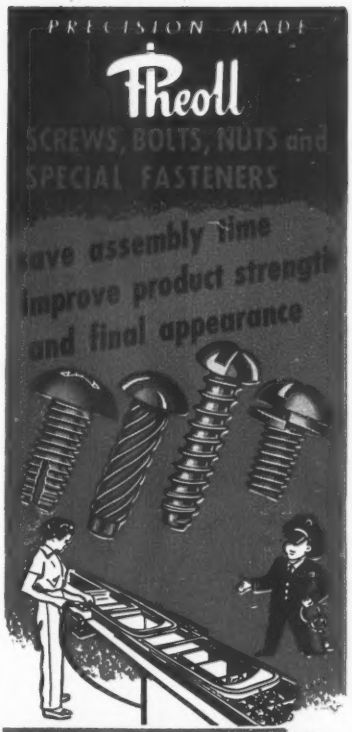
EXPANDED METAL guards are installed by a maintenance electrician to protect street lamps against stone throwing vandals. Guards are made by Wheeling Corrugating Co., Wheeling, W. Va., and are expected to virtually eliminate lamp destruction in New York's Central Park where formerly replacements had to be made as often as ten times a year



TYGON plastic Paint protects metal, concrete and wood from attack by acids, alkalies, oils, fresh or salt water. Tough, flexible film resists impact. Non-contaminating to solutions.

• *Write for Test Samples*

U. S. STONEWARE
Akron 9, Ohio



ACCURATE THREADING SAVES TIME

Pheoll Screws, Bolts, and Nuts are easier to start, easier to drive and easier to tighten—because they're accurately machined and threaded. These features cut your assembly time and cost.

COLD ROLLED THREADING ADDS STRENGTH

The grain structure and flow of metal obtained through cold heading and roll threading increases the structural strength of Pheoll Fasteners. Cold working improves thread bearing surfaces, providing greater area of contact for firmer grip. Greater strength reduces possibility of shearing, and time lost in subsequent removal and retapping.

OUR INSPECTION IMPROVES YOUR PRODUCT APPEARANCE

Step by step Pheoll inspection, through every process of production, assures uniform head size and shape; cleanly milled and recessed heads, neat chamfering and countersinking. All these factors contribute to the quality and finish which add materially to your product's final appearance. *Write* for Pheoll's product literature and price list.

THESE PHEOLL PRODUCTS INCREASE YOUR PRODUCTION RATE. Thumb Screws Machine Screws† • Wood Screws† • Sheet Metal Screws† • Stove Bolts† • Rolled Threaded Wires and Studs • Special Rivets and Pins • Brass Washers

†Furnished in slotted and Phillips Recessed Head Types

Pheoll
MANUFACTURING COMPANY
5700 ROOSEVELT ROAD
CHICAGO 50, ILLINOIS
SCREWS • BOLTS • NUTS

HALLDEN
Automatic Shears

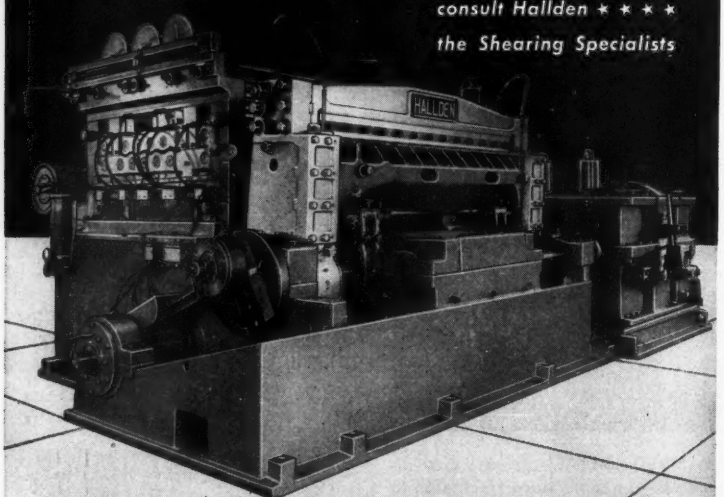
★ FLEXIBLE DESIGN

★ CUTTING ACCURACY

★ CONTINUOUS FEED

★ RUGGED CONSTRUCTION

consult Hallden ★ ★ ★ ★
the Shearing Specialists



THE HALLDEN MACHINE COMPANY

THOMASTON, CONNECTICUT

Sales Representatives

The Wean Engineering Co., Inc., Warren, O. T. E. Dodds, Pittsburgh, Pa.
W. H. A. Robertson & Co., Ltd., Bedford, England

CALENDAR
OF MEETINGS

† Denotes first listing in this column.

Feb. 11-15, National Sand and Gravel Association and National Ready Mixed Concrete Association: Annual meeting, Roosevelt Hotel, New Orleans. Association address: National Theatre Bldg., 13th and E Sts., Washington 4.

Feb. 13-15, Radio-Television Manufacturers Association: Mid-winter conference, Stevens Hotel, Chicago. Association address: 1317 F Street, N.W., Washington 4.

Feb. 14, Steel Kitchen Cabinet Institute: Annual meeting, Hotel Cleveland, Cleveland. Institute address: Engineers Bldg., Cleveland 14.

Feb. 16, Eastern States Blast Furnace Association: Meeting, William Penn Hotel, Pittsburgh.

Feb. 16-23, Automotive Electric Association: Meeting, Edgewater Beach Hotel, Chicago. Association address: 802 Michigan Blvd., Detroit 26.

Feb. 19-22, American Institute of Mining and Metallurgical Engineers: Annual meeting, Jefferson Hotel, St. Louis. Institute address: 29 W. 39th St., New York.

†Feb. 26-29, American Medical Association: Congress on industrial health, Biltmore Hotel, Atlanta, Ga. Association address: 535 N. Dearborn St., Chicago 10.

Mar. 5-7, Hydraulic Institute: Quarterly meeting, Santa Barbara Biltmore Hotel, Santa Barbara, Calif. Institute address: 122 E. 42nd St., New York.

Mar. 5-9, American Society for Testing Materials: Spring meeting, Cincinnati. Society address: 1916 Race St., Philadelphia.

Mar. 6-8, Society of Automotive Engineers: Passenger car, body and materials meetings, Hotel Book Cadillac, Detroit. Society address: 29 W. 39th St., New York.

Mar. 6-9, American Roadbuilders Association: Meeting, Cincinnati. Association address: 1319 F St., Washington 4.

Mar. 12-15, National Electrical Manufacturers Association: Meeting, Edgewater Beach Hotel, Chicago. Association address: 155 E. 44th St., New York 17.

Mar. 13-16, National Association of Corrosion Engineers: Conference and exhibition, Statler Hotel, New York. Conference committee address: P. O. Box 6120, Philadelphia 15.

Mar. 15-17, American Society of Tool Engineers: Annual meeting, Hotel New Yorker, New York. Society address: 10700 Puritan Ave., Detroit 21.

Mar. 18-23, Pressed Metal Institute: Spring meeting and technical session, Hotel Carter, Cleveland. Institute address: 13210 Shaker Square, Cleveland 20.

†Mar. 19-21, National Association of Waste Material Dealers: Annual meeting, Stevens Hotel, Chicago. Association address: 1109 Times Bldg., New York.

†Mar. 19-21, Steel Founders' Society of America: Annual meeting, Edgewater Beach Hotel, Chicago, Society address: 920 Midland Bldg., Cleveland 15.

†Mar. 19-23, American Society for Metals: Seventh western metal exposition and congress, auditorium and exposition hall, Oakland, Calif. Exposition address: 215 S. Clark Dr., Beverly Hills, Calif.

†Mar. 21-22, American Hot Dip Galvanizers Association Inc.: Annual meeting, Hotel Biltmore, Atlanta, Ga. Association address: 2311 First National Bank Bldg., Pittsburgh 22.

†Apr. 2-3, Diamond Core Drill Mfrs. Association: Annual meeting, The Homestead, Hot Springs, Va., Association address: 122 E. 42nd St., New York.

†Apr. 2-4, American Institute of Mining and Metallurgical Engineers: Open hearth and blast furnace, coke oven and raw materials conference, Statler Hotel, Cleveland. Institute address: 29 W. 39th St., New York.

A Winning Pair

FORT DUQUESNE • STEEL •

You can pick the winners every time. On the ice, it's a pair of graceful, talented skaters. In steel, it's the two famous trade marks, representing *the best* in dependable warehouse service.

COLD FINISHED BARS — Rounds, Flats, Squares, Hexagons.

STRIP — Cold Rolled, Hot Rolled, Pickled. Coils and Cut Lengths.

SPRING STEEL — Tempered, Annealed.

ALUMINUM — Sheets, Strip, Bars, Tubing.

SHEETS — Cold Rolled, Hot Rolled, Pickled, Galvanized. Coils and Cut Lengths.

TUBING — Seamless and Welded, Carbon and Alloy.

TIN MILL PRODUCTS — Black Plate.

STAINLESS — Sheets, Strip, Bars, Tubing.

DRILL ROD • FLAT WIRE • SHANK STEEL • SHIM STEEL • SILVER BRAZING ALLOYS AND FLUXES

Complete Facilities for Cutting, Sawing, Shearing, Slitting, and Storage.

FORT DUQUESNE STEEL COMPANY
PITTSBURGH 33, PENNSYLVANIA

The HAMILTON STEEL COMPANY
CLEVELAND 8, OHIO

Iron and Steel *need protection too!*

If it's made of iron or steel,
and exposed to the elements,
remember to have it
Hot-Dip Galvanized—*sealed in zinc!*

HANLON-GREGORY
Galvanizing Company
pittsburgh...pennsylvania

the world's largest job galvanizing plant

in the heart of the STEEL INDUSTRY

HOT DIP

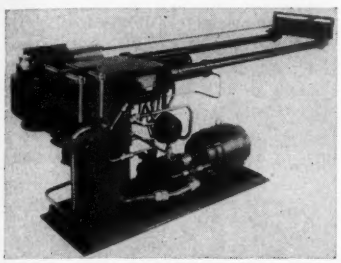
galvanizing.....pickling.....painting.....oiling

New Products and Equipment

Space Saving Bender

A compact pipe and tube bending machine is introduced by Wallace Supplies Mfg. Co., 1300 Diversey Pkwy., Chicago 14, Ill. Model No. 800 is 21 inches wide 34 inches high and 78 inches long. Unit is powered by a 2 hp 220/440 v, three phase, 60 cycle motor.

It is operated by a single lever which when pushed down causes the



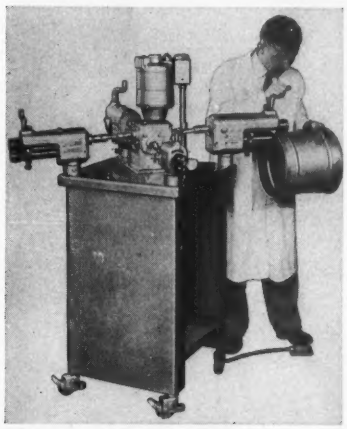
bending arm to swing around to the degree of bend selected and stay there until the operator has removed the bent part, then the lever is moved up and the arm swings back to its original position. Bending die is held on by four spring clips for easy changing. It can be changed from a right hand bender to a left hand bender by changing the pressure and clamping arms over and inserting the bolts into holes ready for that purpose. The 10-inch steel pipe to which the top and base are welded is also the tank containing the hydraulic fluid.

Check No. 1 on Reply Card for more Details

Rotary Operations Performed

A multi-drive power table for beading, crimping, burring, turning, wiring, flanging, elbow edging, etc., is introduced by Niagara Machine & Tool Works, Buffalo, N. Y. Two electric footbuttons on the end of flexible cable and located on opposite sides of the table provide convenient means to control the driving motor, freeing the operator's cranking arm for guiding work in rolls. Table has positions for four machines permitting permanent setup and saving time spent in hunting tools, changing rolls and setting gages.

Welded steel table, mounted on casters is sturdy, compact and light. Power unit consists of a Niagara worm reduction unit mounted on antifriction bearings and operating in a bath of oil. A ¼-hp, 110 v, single phase ac motor with reversing switch and overload protection is flange mounted as an integral part of the power unit. Table comes complete with eight steel universal joints, four coupling shafts and all electrical



equipment. Existing rotary hand machines can be used or new ones ordered to suit requirements.

Check No. 2 on Reply Card for more Details

Squaring Shears Improved

Expansion and improvement of its new series power squaring shear line is announced by Columbia Machinery & Engineering Corp., Hamilton, O. Shears are available in a complete range of sizes in capacities of 3/16-inch up to 12 feet, ¼-inch up to 14 feet, ⅜-inch up to 20 feet, ½-inch and ¾-inch up to 14 feet, 1 inch up to 12 feet, and 1¼ inches by 6 feet. Smaller units are all welded roll steel construction using the heavy steel

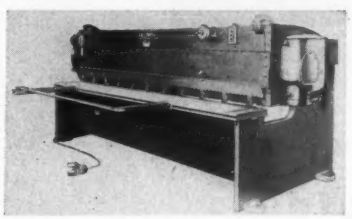


plate work chute as a structural member. Models ¼-inch by 14 feet and larger are of assembled rolled steel construction with structural members dovetailed into each other and bolted.

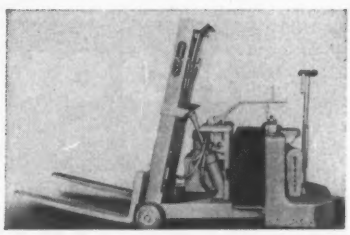
A design feature is the air operated disk clutch installed in the flywheel and controlled by a solenoid through a jog switch or foot switch. Since clutch is placed ahead of gears, there is no motion in the gear train when the shear is not in the cutting cycle. Full cutting capacity is obtained with 80 pounds air pressure, but the operating pressure may be lowered to provide overload protection. A spring operated disk brake, powerful enough to stop and hold the ram in any position for blade adjustment and at top position in regular cutting operation, automatically stops the shear in event of air or power failure. A blade changing jig is furnished with models ¼-inch by 14 feet and larger, and ball transfers are available for tables of models ½-inch by 6 feet and larger.

Check No. 3 on Reply Card for more Details

Ramps No Obstacle

Moto-Truc Co., 1953 E. 59th St., Cleveland 3, O., has developed an 18 v motor drive unit for use on heavy counterbalance trucks for ramp operation. Field tests show the 18 v truck has up to 30 per cent more power than 12 v trucks with similar specifications.

It is available in a 2000 pound capacity with a 24-inch load center and a 2500 pound capacity with an 18-inch or 24-inch load center. Lifting



heights are: 94 and 120 inches with corresponding collapsed mast heights of 72 and 83 inches. Approximate chassis weight is 3000 pounds.

Travel speed is 3 mph with a load, and 3½ mph without a load. Lifting speed is 20 feet per minute with a 2000 pound load.

Check No. 4 on Reply Card for more Details

Flexible Oven Size

An industrial oven using high efficiency rod-type heaters mounted on insulated wall sections is announced by advanced heating division, Jensen Specialties Inc., 9331 Freeland, Detroit 28, Mich. It combines high speed radiant heating with temperature controlled convection for industrial heating and drying operations up to 700° F. No welding is required for assembly and the ovens can be enlarged,

Nothing is as smooth as a
HOOVER HONED RACEWAY*

POLISHED
Polished Raceway surface magnified 100 times as used in other ball bearings.

*HOOVER HONED
Raceway surface magnified 100 times, as used exclusively in Hoover Ball Bearings.

It's the raceway that makes the difference

HOOVER
America's only
BALL BEARING
with Honed Raceways

90% longer life
30% greater load
Amazing Quietness

The Aristocrat of Bearings

HOOVER BALL AND BEARING CO.
ANN ARBOR, MICHIGAN

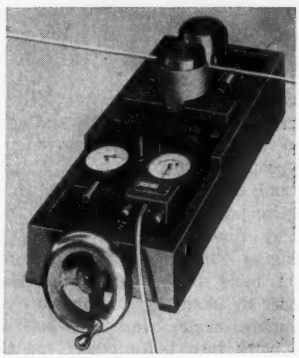
extended or dismantled with changes made in the heating transfer rates by the addition or removal of standard catalog parts. All vital parts are maintained from outside the oven assembly.

From 4 to 40 kw of heat may be installed in each 26 x 84-inch panel. Rod heaters of any standard brand name may be specified. When equipped with approved controls and ventilation these ovens comply with latest industrial oven standards.

Check No. 5 on Reply Card for more Details

Continuous Wire Gaging

Amount of material the extruder places on wires is automatically controlled with a continuous wire measuring gage, model 493 B-80, made by Federal Products Corp., 1144 Eddy St., Providence, R. I. It is designed to handle wire of any size up to 1 inch in diameter. Gage automatically



speeds up or slows down the speed of the wire as it passes through the extruder.

Federal's Electricator is used in transferring the measurements to the speed control. Intermittent irregularities which would cause erratic action in the control are dampened out so the final result is a smooth continuous control of the nominal size of the coated wire. The second indicator is used in setting the gage. Actual diameter of the wire can be seen at all times.

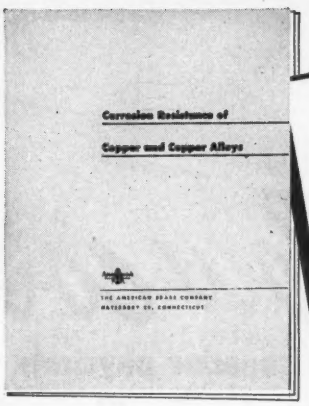
Check No. 6 on Reply Card for more Details

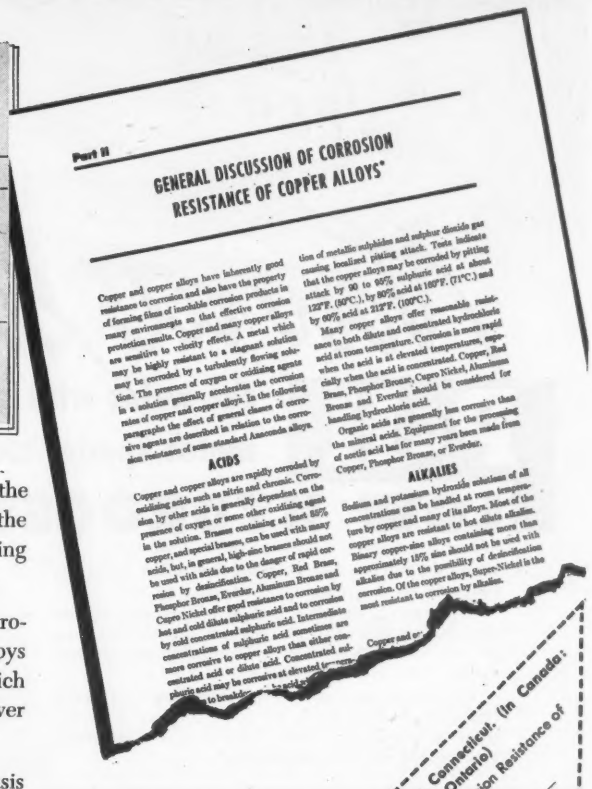
Large Grinding Capacity

A surface grinder with a 6 x 18-inch table and fitted with the latest type of Boneham & Turner removable spindle is available through DCMT Sales Corp., 164 Duane St., New York 13, N. Y., division of British Industries Corp. It allows large parts to be ground when using a magnetic chuck without reducing diameter of the grinding wheel. Automatic cross-feed of the table can be made to op-

NEW! a comprehensive discussion of the corrosion resistance of copper and copper alloys

send for your copy




Part II

GENERAL DISCUSSION OF CORROSION RESISTANCE OF COPPER ALLOYS*

Copper and copper alloys have inherently good resistance to corrosion and also have the property of forming films of insoluble corrosion products in many environments so that effective corrosion protection results. Copper and many copper alloys are sensitive to velocity effects. A metal which may be highly resistant to a stagnant solution may be corroded by a turbulently flowing solution. The presence of oxygen or oxidizing agents in a solution generally accelerates the corrosion rates of copper and copper alloys. In the following paragraphs the effect of general classes of corrosive agents are described in relation to the corrosion resistance of some standard Anaconda alloys.

ACIDS

Copper and copper alloys are rapidly corroded by oxidizing acids such as nitric and chromic. Corrosion by other acids is generally dependent on the presence of oxygen or some other oxidizing agent in the solution. Brasses containing at least 85% copper, and special bronzes, can be used with many acids, but, in general, high-zinc brasses should not be used with acids due to the danger of rapid corrosion by dezincification. Copper, Red Brass, Phosphor Bronze, Everdur, Aluminum Bronze and Copro Nickel offer good resistance to corrosion by hot and cold dilute sulphuric acid and to corrosion by cold concentrated sulphuric acid. Intermediate concentrations of sulphuric acid sometimes are more corrosive to copper alloys than either concentrated acid or dilute acid. Concentrated sulphuric acid may be corrosive at elevated temperatures to brasses

tion of metallic sulphides and sulphur dioxide gas causing localized pitting attack. Tests indicate that the copper alloys may be corroded by pitting attack by 90 to 95% sulphuric acid at about 122°F. (50°C.), by 80% acid at 160°F. (71°C.) and by 60% acid at 212°F. (100°C.).

Many copper alloys offer reasonable resistance to both dilute and concentrated hydrochloric acid at room temperature. Corrosion is more rapid when the acid is at elevated temperatures, especially when the acid is concentrated. Copper, Red Brass, Phosphor Bronze, Copro Nickel, Aluminum Bronze and Everdur should be considered for handling hydrochloric acid.

Organic acids are generally less corrosive than the mineral acids. Equipment for the processing of acetic acid has for many years been made from Copper, Phosphor Bronze, or Everdur.

ALKALIES

Sodium and potassium hydroxide solutions of all concentrations can be handled at room temperature by copper and many of its alloys. Most of the copper alloys are resistant to hot dilute alkalies. Binary copper-zinc alloys containing more than approximately 15% zinc should not be used with alkalies due to the possibility of dezincification corrosion. Of the copper alloys, Super-Nickel is the most resistant to corrosion by alkalies.

Copper and co

This brand-new, 24-page booklet discusses clearly the nature and forms of corrosive attack. It explains the chemical, physical and mechanical factors concerning corrosion resistance of copper and many of its alloys.

Included is a tabulation indicating the relative corrosion resistance of the principal types of copper-base alloys when in contact with 183 different corroding agents which are frequently encountered in industrial processes, power plants, water works, sewage systems, etc.

This booklet offers you a convenient, authoritative basis for selecting copper and copper alloys to combat specific corrosive conditions. Send for your copy. Fill in the coupon today. 51197

The American Brass Company, Waterbury 20, Connecticut. (In Canada: Anaconda American Brass Ltd., New Toronto, Ontario)
Please send a free copy of Bulletin B-36, "Corrosion Resistance of Copper and Copper Alloys."
Name
Company
Street
City Zone State

where corrosion resistance counts — consider

ANACONDA® COPPER AND COPPER ALLOYS

DEPARTMENT OF TECHNOLOGY
BUFFALO PUBLIC LIBRARY

JIM: WHAT ELECTRODE WILL GIVE US--
1. HIGH QUALITY DEPOSITS-PERFECT X-RAY. NO UNDERBEAD CRACKING
2. WELDS IN HIGH QUALITY STEEL WITHOUT POROSITY OR CRACKING
3. LITTLE OR NO PREHEATING
4. HIGH DEPOSITION RATES
5. LOWER COST THAN STAINLESS ROD NOW USED
— BILL
Bill: Your best bet — new P&H Low Hydrogen Electrodes!
Jim

Now at low cost!

P&H LOW HYDROGEN ELECTRODES

For welds with superior physicals that match special steels, simplify production — —

Here's the world's most complete line of low hydrogen electrodes — 14 types to choose from.

Operators prefer them because of their easy manipulation, easy slag removal, smoother deposit, low spatter loss, fast deposit rate, good penetration, and less smoke.

Manufacturers prefer them too. They have fewer rejections. Smaller welds for faster production. Fewer types of rods to buy, stock, and supervise. They eliminate trouble with off-analysis steel.

Simplify your welding procedures. Standardize on P&H Low Hydrogen Electrodes. Your costs are lower, your welds better and stronger.

P&H
WELDING DIVISION
4411 W. National Ave.
Milwaukee 14, Wisconsin
HARNISCHFEGER CORPORATION

2255

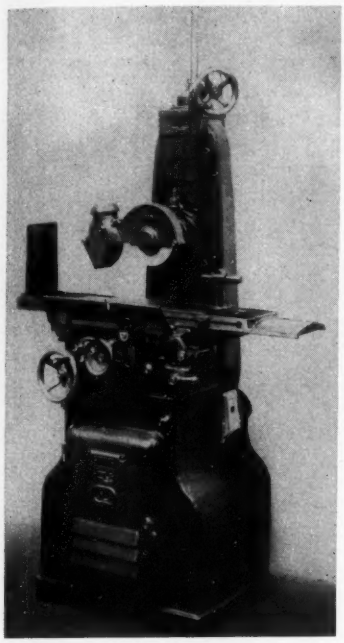
Here are a few of the money-saving P&H Low Hydrogen Electrodes:

- *For problem steels:* High carbon, high sulphur, cold-rolled alloy . . . 70LA and 70LA-2.
- *For steel castings repair;* matches analysis and heat-treating properties of Grade B castings . . . P&H .25C.
- *For steel castings repair;* matches heat treating properties of Grade B castings . . . 70LB.
- *For welding nickel-alloy steels;* gives high impact resistance at low temperatures . . . 75LP.
- *For Chrome-moly steels* (1% Cr., ½% Mo.) used in power piping . . . 80LE.
- *For Chrome-moly steels* (2% Cr., 1% Mo.) used in power piping . . . 90LE.
- *To match heat-treating properties of SAE 1040* and like steels. Also for steel-castings repair . . . P&H .40C.
- *For welding high hardenable steels.* Also steel castings repair . . . AW2B.
- *For repair welding Grade C castings* and steels of similar composition . . . P&H-7.
- *Comparable to SAE 8630 steel* . . . excellent heat-treating and flame-hardening characteristics . . . 90LH-2.
- *For welding high hardenable steels* without pre-heat such as re-rolled rail stock . . . P&H-12 and P&H-17.
- *For aircraft and similar steels* . . . has wide range of properties under heat treatments . . . P&H-21.

Excavators • Overhead Cranes • Hoists • Arc Welders and Electrodes • Soil Stabilizers • Crawler and Truck Cranes • Diesel Engines
Cane Loaders • Pre-assembled Homes

erate at each end of the table traverse, and the feed can be adjusted to advance the table from 0.01-inch to 0.09-inch at each reverse of the table movement.

Crossfeed mechanism can be engaged or released by adjusting the knurled knob which is situated in the center of the graduated dial. The machine has an oil tight compartment in the base for the motor which is protected from abrasive dust. It is fitted with an automatic belt tightener which operates when the grinding head is raised or lowered.



Check No. 7 on Reply Card for more Details

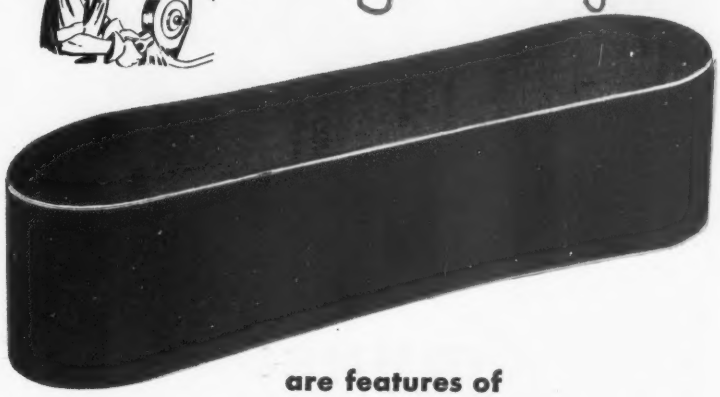
Drum Handling Clamp

Baker Industrial Truck Division, Baker-Raulang Co., 1250 W. 80th St., Cleveland 2, O., has a new drum clamp for handling cylindrical objects either individually or as unit loads on pallets. It picks up individual steel drums, steel or wooden barrels, cardboard drums or any other cylindrical material and loads the pallet which is then handled after two rubber-faced grab plates are removed from the fork.

The two forks move simultaneously. By means of separate hydraulic cylinders they are adjustable from 32 inches inside spacing to 19 inches. Two shoes which slip over and are pinned to standard pallet forks hold curved rubber grab plates. Pressure reducer valve positively controls gripping pressure and can be adjusted so that cardboard drums can be handled

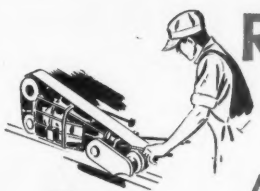
MICHIGAN RED COAT BRAND ABRASIVES

cutting power and long mileage



are features of

RED COAT BRAND ABRASIVE BELTS



Your money's worth in outstanding service . . . rough and rugged are these fast-cutting abrasive belts that can be depended upon to turn out the work with speed and efficiency. Long-lived action assures abrading mileage that gives you the most for your dollar investment.

Every day RED COAT BRAND ABRASIVES are becoming better known to more and more manufacturers who are highly selective in the materials they use.

RED COAT BRAND ABRASIVES are sold by industrial distributors in many principal cities. They are in position to give you prompt service. If your local distributor doesn't handle the RED COAT BRAND line, write direct for a sample test belt and at the same time give us your distributor's name.

Send for simplified discount schedule

Sold by distributors

Michigan RED COAT BRAND ABRASIVES

MICHIGAN ABRASIVE COMPANY • 11900 East Eight Mile Road, Detroit 5, Mich.

Low Cost—Johnson General Purpose Bearings are produced in long runs of each size, at very low unit costs. No charge is made for patterns or tools.

Immediate Delivery—Complete stocks of all sizes are always maintained by Johnson distributors, and by the Johnson Bronze plant and twenty-two warehouses.

Over 850 Sizes—Johnson GP Bearings are made in a wide range of sizes, 55 inside diameters, 55 outside diameters, and 46 lengths from ¾" to 9¾". It is possible to obtain virtually any size combination desired.

Ready to Install—They are completely machined to standard tolerances, ready for immediate installation. Any type of oil groove, slot or hole can be added easily and economically.

Guaranteed Quality—Johnson GP Bearings are cast in a general purpose alloy, providing better than average physical properties and assuring long life and excellent performance. Each individual bearing carries a guarantee to be consistent in alloy, correct in tolerance and of the finest workmanship possible.

If you do not have a Johnson Bronze Catalog of standard size sleeve bearings on your desk, we will be glad to send you one at once. Write today!

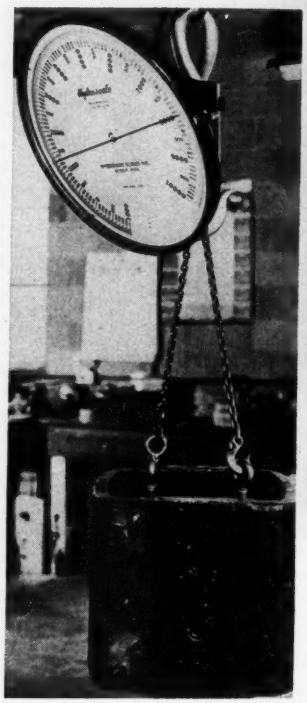
Johnson Bronze
SLEEVE BEARING HEADQUARTERS
550 SOUTH MILL STREET • NEW CASTLE, PA.

without crushing. An accumulator keeps hydraulic pressure constant for safe removal of the drums.

Check No. 8 on Reply Card for more Details

Easier Scale Reading

Dial faces may be tilted downward 25 degrees on a scale made by Hydroway Scales Inc., 20624 W. 8 Mile Rd., Detroit 19, Mich. This modification in the company's Hydroscale line of hydraulic crane scales is made possible by insertion of a V section between



the dial and hydraulic chamber housings.

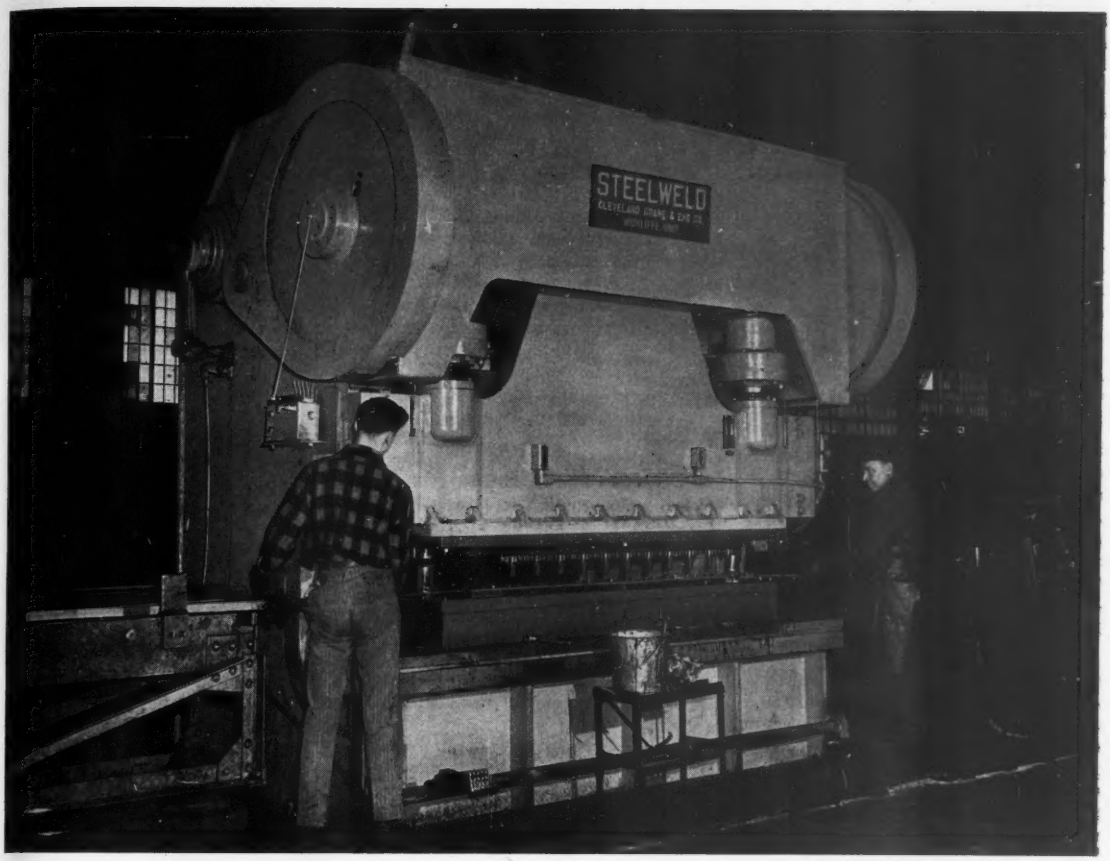
Tilting the dial allows for greater legibilitiy in reading the scale above eye level and is particularly helpful when readings must be made at substantial heights. It does not consume headroom or interfere with the swivel of either eye or hook. This feature is available for all models up to 100,000 pounds capacity.

Check No. 9 on Reply Card for more Details

Portable Tool Filer

A tool and die filing machine made in Sweden is available from Nord International Corp., 50 Church St., New York 7, N. Y. Carbide and hard metal tools can be sharpened without removal from their work place by the Diprofile.

It can be used for filing, honing, polishing and lapping on inner and



Model K5-8 Press, one of two Steelwelds in continuous 24-hour service since 1945, punching a series of holes in bridge floor bars.

2,000 Bars slotted every 8-Hour shift

Although originally conceived as machines for bending metal, Steelweld Presses are now serving a wide variety of uses. Two large Steelwelds at the MacDonald, Ohio Plant of the Carnegie-Illinois Steel Corporation are used solely for punching slots in steel bars, beams and T-sections for bridge flooring.

The time of one press is devoted largely to punching slots in bars 1⅝" and 1-7/16" wide by ¼" thick by 6'-2" long. Each bar contains 13 slots ½" wide by ⅝" to ⅞" long, and 24 slots ¼" wide by ⅝" to ⅞" long, a total of 37 slots all punched at one time. Two thousand bars are slotted in an eight hour shift.

Another standard job is that of punching 2-inch long slots on 4-inch centers in I-beams for bridge sections. These are punched 24 at a time. The beams vary in length from 24'-0" to 45'-0". Two hundred 40'-0" beams are punched in an 8-hour period.

Both Steelweld Presses have been in this service 24 hours a day since 1945.

GET THIS BOOK!

CATALOG No. 2010 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

7832 East 281st Street • Wickliffe, Ohio.

STEELWELD

BENDING PRESSES

BRAKING • FORMING • BLANKING • DRAWING • CORRUGATING • PUNCHING

outer surfaces, as well as for chafing and sawing. Work can be done on materials ranging from hardest carbide bits to glass, plastics and fibrous materials. An adjustable stroke gives high efficiency and also makes it possible to work in shallow holes. It can be mounted in a lathe that can be used for work on rotating surfaces.

Machine is driven from a controllable 10,000 rpm electric motor rated 1/10 to ⅛ hp. It can be rapidly attached to a flexible shaft that also takes other handpieces.

Check No. 10 on Reply Card for more Details

Synchronous Line Broadened

High speed synchronous generators in four basic designs which have ratings from 1.875 to 50 kva are available from General Electric Co., Schenectady 5, N. Y., and extend the company's line to cover from 1.875 to 1250 kva. Designated as types ATI, ASI and ATB, the generators have frequency ratings of 60 and 400 cycles.

Basic 60 cycle design is an externally regulated generator designed to operate with standard voltage regulator in the exciter field circuit. Standard excitation voltage is 64 volts but equipment for 125 v excitation voltage is available. Ratings at 60 cycles vary from 2 kw, single phase, to 15 kw, 3 phase.

Check No. 11 on Reply Card for more Details

• • •

BUBBLER AND TRAP: King Engineering Corp., Ann Arbor, Mich., introduces two new units for use in gas and air lines: Sight feed bubbler to control and visually indicate relatively small rates of flow and the sediment trap for removing dirt and moisture from the line. Both units may be mounted on front of panel or supported in the line by inlet and outlet pipes.

Check No. 12 on Reply Card for more Details

FOR LIGHT DUTY: Curtis Universal Joint Co. Inc., Springfield, Mass., offers a new ball type universal joint. It is designed for light duty applications and is available in four sizes: ½, ¾, 1 and 1¼ inches, single or double, solid or bored hubs.

Check No. 13 on Reply Card for more Details

FAST DRYING PRIMER: Totrust instant dry rust inhibitor primer, introduced by Wilbur & Williams Co., Boston 35, Mass., is a fast drying, penetrating metal primer. It is protection against peeling, chipping, rusting and enables recoating ordinarily from 10 to 30 minutes with all standard types of paint as well as rubber base paints, vinyl coatings and spraying lacquers.

Check No. 14 on Reply Card for more Details

MILLING CUTTERS: A truncated triangular blade is featured in the new line of heavy duty milling cutters, introduced by Weddell Tools Inc., Rochester 11, N. Y. A wedge type lock permits locking and unlocking the blade within a quarter to a half turn of an Allen wrench. Locking unit is self-contained and wedge is actuated to and fro without use of hammers or drifts.

Check No. 15 on Reply Card for more Details

RECTIFIER CARTRIDGES: High voltage selenium rectifier cartridges with voltage ratings up to 25,000 v per cartridge and current ratings up to 75 ma, have been developed by International Rectifier Corp., Los Angeles 43, Calif. They utilize five different selenium cell sizes varying from ⅛-inch in diameter up to 1-inch in diameter with corresponding current ratings varying from 1.5 up to 75 ma.

Check No. 16 on Reply Card for more Details

CLEANS SMALL PARTS: For cleaning small metal parts by use of soft abrasives, a sandblast cabinet is offered by W. W. Sly Mfg. Co., Cleveland 2, O. It can also be used with sand or metal abrasives. Cabinet is complete with two light fixtures for illuminating the interior, an exhaust fan and a dust bag for making operation dustless.

Check No. 17 on Reply Card for more Details

NO ACID CLEANING: Magicoat, announced by Magnus Chemical Co., Garwood, N. J., is a coating designed for drawing wire without any acid cleaning. It forms a dark, glossy oxide with excellent lubricity. It also makes rod and wire impervious to rust.

Check No. 18 on Reply Card for more Details

SMALL PUMP: A small pump available from Taco Heaters Inc., Providence 3, R. I., may be used as a refrigerator pump, coolant pump, water circulator and other applications where it is desired to move water or soluble oils not under pressure. It will pump 10 gallons per minute against a 3-foot head.

Check No. 19 on Reply Card for more Details

FOR SAFE HANDLING: Jumbo crucible tongs, made by Fisher Scientific Co., Pittsburgh 19, Pa., are nearly 21 inches long and are made of 18/8 stainless steel. Handle provides separate grips for thumb and one finger. The hand firmly supports the entire weight of the crucible and tongs because handle extends beyond the finger grips. To prevent handles from slipping out of alignment, joints of the tongs are flattened.

Check No. 20 on Reply Card for more Details

HOLDS WORK FIRMLY: Known as De-Sta Co No. 650, a new heavy duty plunger type toggle clamp is introduced by Detroit Stamping Co., Detroit 3, Mich. It positions and holds work firmly in place with toggle locking action that is said to deliver holding pressures up to 4000 pounds.

Check No. 21 on Reply Card for more Details

NO SPILLING: No. 11 carboy tilter with pouring spout, made by General Scientific Equipment Co., Philadelphia, Pa., assures safe, fast and easy method of pouring acids and other liquids from carboys. The air vent pouring spout, made of acid resistant rubber and plastic tubing, permits a smooth flow of acid without spurts or splashes.

Check No. 22 on Reply Card for more Details

SAFETY SOLVENT: FO 128, developed by Fine Organics Inc., New York 3, N. Y., may be used as a safe alternative for carbon tetrachloride in applications where toxicity or solvent residues are factors. It may be used for cleaning of both mechanical and electrical equipment parts with complete safety to materials and men.

Check No. 23 on Reply Card for more Details

REDUCES NOISE: Designed for use on bins, hoppers, chutes, shakeouts, etc., style EM "quiet type" vibrators, are offered by Cannon Vibrator Co., Cleveland 14, O. There is no impact of the piston on either end. They are available in 1⅝-inch to 4-inch sizes.

Check No. 24 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Helpful Literature

73. Universal Drilling Table

Cincinnati Gilbert Machine Tool Co.—2-page illustrated leaflet 850 tells how universal table can be used to drill at any angle up to 90 degrees on five sides with one set-up. Four-point support of work affords maximum rigidity and assures accuracy.

74. Feed Water Control

Bailey Meter Co.—16-page illustrated bulletin No. 105-C outlines latest developments in three-element feed water control. Diagrams, chart records and installation views demonstrate how this system eliminates serious fluctuations in boiler water level.

75. Tube Fabrication

A. B. Murray Co.—4-page illustrated folder "Modern Tube Fabrication" discusses facilities and depicts tube forming equipment and finished work. Uses of tube and pipe as structural components of finished products are described.

76. Corrugated Metal Pipe

Armco Drainage & Metal Products, Inc.—16-page illustrated booklet CMS-5850 lists types of full-round pipe and Pipe-Arch available to meet specific requirements for various types of sewers, culverts, conduits or irrigation systems.

77. Lathe Converter

Master Mfg. Co.—20-page illustrated catalog No. 450 describes attachment for lathe or turret which allows performing milling, boring, drilling, grinding, slotting, indexing and internal keyseating operations.

78. Broaching Equipment

Oilgear Co.—1-page illustrated bulletin AD 50-4321 discusses application of broaching machines for precision machining of parts. Single slide vertical surface broaching machines which produce up to 1600 parts per hour are depicted.

79. Fork Trucks

Baker-Raulang Co. — 8-page illustrated bulletin No. 1324 translates into user benefits design and construction features of FT fork trucks in 3000 and 4000-lb capacities. Shown also are many attachments for extending usefulness of these trucks.

80. Laboratory Safety

Fisher Scientific Co.—40-page illustrated "Manual of Laboratory Safety" lists 'Ten Commandments' of laboratory safety and discusses accident prevention, first aid, fire prevention and safety equipment. Complete material useful in implementation of laboratory safety programs is included.

81. Protective Wrapping

Nox-Rust Chemical Corp.—20-page illustrated "How Book" gives complete data on Nox-Rust Vapor Wrapper which is designed to prevent corrosion of iron and steel. Finished parts are protected in storage, transfer or handling by wrapping them in this material. Actual applications in large manufacturing plants are cited and described.

82. Flooring Materials

Multi-Clean Products, Inc.—4-page illustrated form No. 2400 on terrazzo flooring material relates advantages of use; recommended procedure for installation and maintenance; and use of safety cleaner, terrazzo sealer and antislip waterproof floor wax on material.

83. Hardness Tester

Ames Precision Machine Works—6-page illustrated bulletin "Ames Precision Hardness Tester" describes portable instrument for quick spot tests which reads directly in Rockwell hardness scales. Models for testing rounds and flats and having capacities of 1, 2 and 4 in. are described.

84. Pressure Reducing Valve

Golden-Anderson Valve Specialty Co.—6-page illustrated bulletin features operating and application information on line of cushioned water pressure reducing valves and reducing pilot valves. Sizes from 2½ in. to 24 in. are available.

85. Diamond Tools

Precision Diamond Tool Co.—16-page illustrated catalog 50 is descriptive of diamond tools for grinders, dressers, boring and turning as well as cluster and multiple diamond tools. Reference tables give data on shapes, sizes, resetting and other pertinent information.

86. Heat Treating

Republic Steel Corp.—56-page illustrated manual "Heat Treating Republic Alloy Steels" is complete with reference charts and engineering data. In addition to covering heat treatment and transformation of austenite, heat treating methods are described. These include annealing, hardening, martempering, carburizing, nitriding, cyaniding, flame hardening and induction hardening. Mechanical properties of alloy steels are tabulated.

FOR MORE INFORMATION USE ONE OF THESE CARDS . .

FIRST CLASS
PERMIT No. 36
(Sec. 34.9 P.L. & R.)
Cleveland, Ohio

BUSINESS REPLY CARD
No Postage Stamp Necessary If Mailed in the United States

4c POSTAGE WILL BE PAID BY—

STEEL
Penton Building
CLEVELAND 13, OHIO

Readers' Service Dept.

STEEL Numbers				
1	21	41	61	81
2	22	42	62	82
3	23	43	63	83
4	24	44	64	84
5	25	45	65	85
6	26	46	66	86
7	27	47	67	87
8	28	48	68	88
9	29	49	69	89
10	30	50	70	90
11	31	51	71	91
12	32	52	72	92
13	33	53	73	93
14	34	54	74	94
15	35	55	75	95
16	36	56	76	96
17	37	57	77	97
18	38	58	78	98
19	39	59	79	99
20	40	60	80	100

STEEL 2-12-51
Penton Building, Cleveland 13, Ohio

Please send ☐ Literature ☐ Price information ☐ Nearest source of supply on the items circled at the left.

NAME _____ TITLE _____

COMPANY _____

PRODUCTS MANUFACTURED _____

ADDRESS _____

CITY and ZONE _____ STATE _____

This card MUST be completely filled in. Please TYPE or PRINT

DEPARTMENT OF TECHNOLOGY
BUFFALO PUBLIC LIBRARY

87. Powdered Metal Fabrication

Powdered Metal Products Corp. of America—Illustrated revised catalog details powdered metal fabrication possibilities for various types of parts such as gears, bearings, filters, cams and electronic cores.

88. Bonding & Casting Resins

Ciba Co.—4-page illustrated bulletin explains how Araldite triple function resins of the ethoxyline class provide interesting properties for industrial bonding, casting and coating applications.

89. Tube Bending Slide Chart

Carpenter Steel Co.—Slide chart presents data on desirable minimum radii for economical bending of stainless tubing and pipe. It covers tubing ranging from ⅜ to 5-in. OD in Birmingham wire gages from 22 through 11.

90. Hydraulic Cylinders

Miller Motor Co.—8-page illustrated bulletin H-104 presents hydraulic cylinder dimensional data including oversize rods and ports and double rod end types for pushing, pulling, lifting and clamping applications. Bores range from 1½ to 12 in. and operating pressures from 2000 to 3500 psi.

91. Ball Bearing Centers

Ready Tool Co.—4-page illustrated bulletin No. 483-R describes Red-E regular ball bearing live centers for production and tool room use where high-speed steel cutting tools are used. They feature increased head size that permits use of larger bearings and have greater radial and thrust load capacities.

92. Industrial Furnaces

Despatch Oven Co.—6-page illustrated folder No. 84 shows how CF furnaces harness heat for fast, accurate processing in temperature range of 275 to 850° F. Toolroom and production models for 275 to 1250° F are covered. Specifications and construction details are given on entire line.

93. Pyrometer Accessories

Bristol Co.—56-page illustrated catalog of thermocouple and pyrometer accessories contains data on proper application and use of these devices. Listed are hundreds of supply items including assembled thermocouples, thermocouple wires, extension wires, protection tubes, insulators and other accessories. Modern practices of industrial pyrometry are explained.

94. Welding & Cutting Torches

Air Reduction Sales Co.—36-page illustrated catalog No. 2 lists various types of hand torches for gas welding and cutting, brazing, heating, descaling and flame hardening. Also listed are complete outfits, tips and accessories.

95. Circular Products

Bethlehem Steel Co.—32-page illustrated booklet 216 is guide to rolled and forged circular products for gear blanks, industrial wheels, crane wheels, brake drums, turbine rotors, flywheels, mine locomotive wheels, tire molds and rings, pistons, sheaves and other products.

96. Sling Chains

Cleveland Chain & Mfg. Co.—4-page illustrated bulletin SC-48 is descriptive of Sterling wrought iron sling chains and presents safety rules and full data on chain inspection, use and care. Specifications and recommended load limits are listed for various chain sizes and suspension angles.

97. Rolled & Welded Products

Cleveland Welding Co.—8-page illustrated bulletin "Cleve-Weld Circular, Rolled and Welded Steel Products" explains services offered and shows typical products which are made to customers' specifications. Described are rings, gear blanks, motor and generator frames, wire spools, wheel rims and weldments.

98. Billet Shears

Buffalo Forge Co.—28-page illustrated bulletin No. 3295-A features billet shears for cutting round-cornered square stock or rounds. They are production machines for continuous operation. Briefly, covered are standard, special and diagonal bar cutters and special arrangements which can be provided.

99. Flooring Material

Inland Steel Co.—12-page illustrated brochure "4-Way Safety Plate" describes rolled-steel flooring material for safe footing in plants and on products. Of raised lug pattern design, it provides ample traction for feet and wheels as well as free drainage.

100. Tubing Tolerances

Babcock & Wilcox Tube Co.—Data card 115C is table on tolerances for round seamless carbon and alloy steel mechanical tubing which gives permissible variations in diameter and wall thickness. It refers to cold-drawn unannealed and finished annealed tubing in sizes to 8⅞-in. OD and to hot-finished tubing in sizes to 9⅝-in. OD.

FOR MORE INFORMATION USE ONE OF THESE CARDS . .

STEEL Numbers				
1	21	41	61	81
2	22	42	62	82
3	23	43	63	83
4	24	44	64	84
5	25	45	65	85
6	26	46	66	86
7	27	47	67	87
8	28	48	68	88
9	29	49	69	89
10	30	50	70	90
11	31	51	71	91
12	32	52	72	92
13	33	53	73	93
14	34	54	74	94
15	35	55	75	95
16	36	56	76	96
17	37	57	77	97
18	38	58	78	98
19	39	59	79	99
20	40	60	80	100

STEEL 2-12-51

Penton Building, Cleveland 13, Ohio

Please send ☐ Literature ☐ Price information ☐ Nearest source of supply on the items circled at the left.

NAME TITLE

COMPANY

PRODUCTS MANUFACTURED

ADDRESS

CITY and ZONE STATE

This card MUST be completely filled in. Please TYPE or PRINT

DEPARTMENT OF TECHNOLOGY
BUFFALO PUBLIC LIBRARY

FIRST CLASS PERMIT No. 36 (Sec. 34.9 P.L.&R.) Cleveland, Ohio

BUSINESS REPLY CARD
No Postage Stamp Necessary If Mailed in the United States

4c POSTAGE WILL BE PAID BY—

STEEL
Penton Building
CLEVELAND 13, OHIO

Readers' Service Dept.

The Market Outlook

"SICK" switchmen and old man winter ganged up last week to cause the nation estimated loss of at least 100,000 net tons of critically needed steel ingots, as well as large tonnages of pig iron, finished steel products and coke. In addition, metalworking operations over a wide area were adversely affected with accompanying labor layoffs, all because of curtailments due to transportation difficulties arising from the switchmen's wildcat strike, and the cutting off of industrial gas supplies because of severe winter weather. Car shortages and generally delayed transport had forced sharp cutbacks in steelmaking activities at several points late in the week. It will take industry some time to recover fully from the predicament.

PRODUCTION—Curtailment in steelmaking operations dropped the national ingot rate 4.5 points to 97 per cent of capacity. Cutback was severest in the Cleveland district where the rate fell 55 points to 21.5 per cent of capacity.

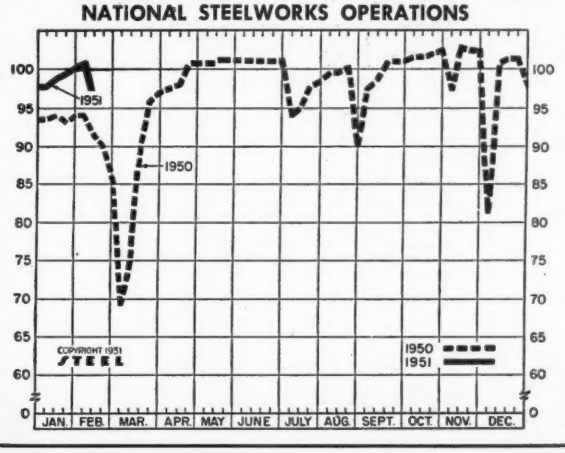
DEMAND—Pressure on the mills mounts daily. Defense and related requirements are rising steadily with corresponding reduction in supplies for the general trade. Steelmakers are booked well into third quarter on DO business, but they are only now setting up customers' quotas on regular accounts for April. Indictions are allotments will be at least 10 per cent smaller than in March, and further cutbacks may be necessary due to the tonnage lost in the rail strike. Expectations are some easing in civilian goods requirements will be experienced soon with mandatory curtailment in production, including automobiles, reportedly actively under consideration in Washington.

ALLOCATIONS— Added light on what is in prospect for second quarter steel allocations may come this week. The NPA Steel Task Committee meets Feb. 13 and is expected to set up allocations at least through May on not only existing directives but on several new programs as well, such as for locomotives, ship and ship repairs, and petroleum industry requirements. Expectations are tonnage allotments for May and June will be on month-to-month basis, efforts appearing to be in the direction of shaping allocations in such fashion as to permit quick adoption of a Controlled Materials Plan, possibly as early as July.

PRODUCTS—All finished steel products, including specialties, are in tighter supply. Sheets, bars, plates and shapes are in most acute stringency in the carbon classifications. Alloy steels are notably short with conditions deteriorating as demand rises and supplies of critical alloying metals, such as nickel, molybdenum and tungsten tighten through government end-use regulations and curtailments.

PRICES— Most significant development pricewise revolves around imposition of ceiling prices on scrap by the Office of Price Stabilization. The ceilings, effected Feb. 7, roll back prices from $6 to $10 per ton on standard grades of scrap and up to $60 on specialties. Surprisingly, the government control action is greeted with relatively little criticism in the trade. The rollback is about in line with expectations and the ceilings are considered sufficiently high to encourage collections. In fact, the No. 1 heavy melting steel ceiling is only about $1.50 per ton under the prevailing price at Pittsburgh early in January. Otherwise the steel market is steady. STEEL's price composite on steelmaking scrap is now pegged at $44 under the government ceilings as compared with $48 a week ago, and $27.42 in the like week a year ago. The weighted index on finished steel products is holding at 171.92 as is the arithmetical composite at the revised figure of $106.32.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Feb. 10	Change	Same Week 1950	Same Week 1949
Pittsburgh	98.5	0.5*	95	97.5
Chicago	99.5	— 0.5*	100.5	100
Eastern Pa.	98.5	— 2.5	76	97
Youngstown	106	0	92	105
Wheeling	97	0	101	94.5
Cleveland	21.5	—55*	96.5	96
Buffalo	104	0	101.5	104
Birmingham	100	0	100	100
New England	85	— 7	80	89
Cincinnati	106	+ 2	101	102
St. Louis	88.5	— 2	84.5	89.5
Detroit	104.5	— 4.5	104	106
Western	103	0	88.5	..
Estimated national rate	97	— 4.5	91.5	100

Based on weekly steelmaking capacity of 1,999,035 net tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950; 1,843,516 tons for 1949.

* Change from revised rate for preceding week.

The Metalworking Outlook—p. 35 *Production-Engineering News—p. 71*

Composite Market Averages

	Feb. 8 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100) ..	171.92	171.92	171.92	156.13	106.82
Index in cents per lb.	4.657	4.657	4.657	4.230	2.894
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$106.32	$106.32*	$105.55	$93.00	$58.27
No. 2 Fdry, Pig Iron, GT..	52.54	52.54	52.54	46.47	25.42
Basic Pig Iron, GT.....	52.16	52.16	52.16	45.97	24.75
Malleable Pig Iron, GT ...	53.27	53.27	53.27	47.27	26.04
Steelmaking Scrap, GT ..	44.00	48.00*	45.50	27.42	19.17

* Revised.

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39. Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Feb. 8 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh....	3.70	3.70	3.70	3.45	2.25
Bars, H.R., Chicago	3.70	3.70	3.70	3.45	2.25
Bars, H.R., del. Philadelphia	4.18	4.18	4.18	3.93	2.57
Bars, C.F., Pittsburgh....	4.55	4.55	4.55	4.10-15	2.75
Shapes, Std., Pittsburgh ..	3.65	3.65	3.65	3.40	2.10
Shapes, Std., Chicago	3.65	3.65	3.65	3.40	2.10
Shapes, del. Philadelphia ..	3.90	3.90	3.90	3.46	2.215
Plates, Pittsburgh	3.70	3.70	3.70	3.50	2.25
Plates, Chicago	3.70	3.70	3.70	3.50	2.25
Plates, Coatesville, Pa.	4.15	4.15	4.15	3.60	2.25
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.50	2.25
Plates, Claymont, Del.	4.15	4.15	4.15	3.60	2.25
Sheets, H.R., Pittsburgh...	3.60-75	3.60-75	3.60-75	3.35	2.20
Sheets, H.R., Chicago	3.60	3.60	3.60	3.35	2.20
Sheets, C.R., Pittsburgh ..	4.35	4.35	4.35	4.10	3.05
Sheets, C.R., Chicago	4.35	4.35	4.35	4.10	3.05
Sheets, C.R., Detroit	4.55	4.55	4.55	4.30	3.15
Sheets, Galv., Pittsburgh..	4.80	4.80	4.80	4.40	3.70
Strip, H.R., Pittsburgh...3.75-4.00		3.75-4.00	3.75-4.00	3.25	2.10
Strip, H.R., Chicago	3.50	3.50	3.50	3.25	2.10
Strip, C.R., Pittsburgh ...4.65-5.35		4.65-5.35	4.65-5.35	4.15	2.80
Strip, C.R., Chicago	4.90	4.90	4.90	4.30	2.90
Strip, C.R., Detroit 4.35-5.60		4.35-5.60	4.35-5.60	4.35-40	2.90
Wire, Basic, Pittsburgh ..4.85-5.10		4.85-5.10	4.85-5.10	4.50	2.75
Nails, Wire, Pittsburgh ..5.90-6.20		5.90-6.20	5.90-6.20	5.30	2.90
Tin plate, box, Pittsburgh.	$8.70	$8.70	$8.70	$7.50	$5.00

SEMIFINISHED

Billets, forging, Pitts.(NT)	$66.00	$66.00	$66.00	$63.00	$42.00
Wire rods, ½-⅝", Pitts. ..	4.10-30	4.10-30	4.10-30	3.85	2.15

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$47.00	$26.25
Basic, Valley	52.00	52.00	52.00	46.00	25.25
Basic, del. Phila.	56.39	56.39	56.39	49.44	27.09
No. 2 Fdry, Pitts.	52.50	52.50	52.50	46.50	25.75
No. 2 Fdry, Chicago	52.50	52.50	52.50	46.50	25.75
No. 2 Fdry, Valley	52.50	52.50	52.50	46.50	25.75
No. 2 Fdry, Del. Phila. ...	56.89	56.89	56.89	49.94	27.59
No. 2 Fdry, Birm.	48.88	48.88	48.88	42.38	22.13
No. 2 Fdry (Birm.) del. Cin.	55.58	55.58	55.58	49.08	25.81
Malleable Valley	52.50	52.50	52.50	46.50	25.75
Malleable, Chicago	52.50	52.50	52.50	46.50	25.75
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	60.00	33.00
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	175.00	140.00*

* Delivered, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt. Pitts...	$45.00	$51.50	$46.50	$31.25	$20.00
No. 1 Heavy Melt. E. Pa..	43.50	47.50	45.00	23.50	18.75
No. 1 Heavy Melt. Chicago	43.50	45.00	45.00	27.50	18.75
No. 1 Heavy Melt. Valley..	45.00	51.25	46.25	31.25	20.00
No. 1 Heavy Melt. Cleve..	44.00	50.75	45.75	28.25	19.50
No. 1 Heavy Melt. Buffalo.	44.00	51.50	44.88	27.75	19.25
Rails, Rerolling, Chicago..	52.50	67.00	67.00	39.50	22.25
No. 1 Cast, Chicago	49.00*	62.00	62.00	40.50	20.00

*F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn., Connlsvl...	$14.75	$14.75	$14.75	$13.25	$7.50
Beehive, Fdry., Connlsvl...	17.50	17.50	17.50	15.50	8.25
Oven Fdry., Chicago	21.00	21.00	21.00	21.00	13.00

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	18.50	12.00
Zinc, E. St. Louis	17.50	17.50	17.50	9.75	8.25
Lead, St. Louis	16.80	16.80	16.80	11.80	6.35
Tin, New York 182.50		182.50	173.00	74.50	52.00
Aluminum, del.	19.00	19.00	19.00	17.00	15.00
Antimony, Laredo, Tex. ..	42.00	42.00	32.00	27.25	14.50
Nickel, refinery, duty paid.	50.50	50.50	50.50	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$54.00	$54.50	$55.00	$55.50
Brooklyn, N.Y., del.	....	58.79	59.29	....
Newark, del.	56.63	57.13	57.63	58.13
Philadelphia, del.	56.39	56.89	57.39	57.89
Birmingham District				
Alabama City, Ala. R2	48.38	48.88	....	....
Birmingham R3	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.58	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda, N.Y., W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y., T9	....	52.50	53.00	....
Boston, del.	61.26	61.76	62.20	....
Rochester, N.Y., del.	54.63	55.13	55.63	....
Syracuse, N.Y., del.	55.58	56.08	56.58	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary, Ind. U5	52.00	....	52.50	....
Indiana Harbor, Ind. I-2	52.00	....	52.50	....
So. Chicago, Ill. W14	52.00	52.50	52.50	....
So. Chicago, Ill., Y1	52.00	52.50	52.50	....
So. Chicago, Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	53.89	54.39	54.39	54.89
Muskegon, Mich., del.	....	57.98	57.98	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron, del. from Cleve.	54.39	54.89	54.89	54.39
Lorain, O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie, Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1	....	53.25	53.75	....
Fontana, Calif. K1	58.00	58.50	....	....
Geneva, Utah G1	52.00	52.50	....	....
Seattle, Tacoma, Wash., del.	....	60.20	....	....
Portland, Oreg., del.	....	60.20	....	....
Los Angeles, San Francisco, del.	59.70	60.20	....	....
Granite City, Ill. K7	53.90	54.40	54.90	....
St. Louis, del. (inc. tax)	54.65	55.15	55.65	....
Ironton, Utah C11	52.00	52.50	....	....
Lone Star, Tex. L6	48.00	*48.50	48.50	....
Minnequa, Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
Neville Island, Pa. P6	....	52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	53.69	53.69	54.19
McKees Rocks, del.	....	53.45	53.45	53.95
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	53.94	53.94	54.44
Verona, del.	....	54.40	54.40	54.90
Brackenridge, del.	....	54.63	54.63	55.13
Bessemer, Pa. U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	....	....	....
McKeesport, Pa. N3	52.00	....	....	53.00
Monessen, Pa. P7	54.00	....	....	....
Sharpsville, Pa. S6	....	....	52.50	53.00
Steelton, Pa. B2	54.00	54.50	55.00	55.50
Swedeland, Pa. A3	56.00	56.50	57.00	57.50
Toledo, O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.01	57.51	....	....
Troy, N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield, O., del.	56.26	56.76	56.76	57.26

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

Niagara Falls, N.Y. P15	$83.00
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos. semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$66.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton, Pa. B2	60.00
Philadelphia delivered	63.00
Troy, N.Y. R2	60.00

(Material in this department is protected by copyright and its use in any form without permission is prohibited)

Semifinished and Finished Steel Products

Mill prices as reported to STEEL Feb. 8, 1951; cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ...$79.00
Munhall,Pa. U5 .....52.00

INGOTS, Alloy (NT)
Detroit R7 .....$54.00
Fontana,Calif. K1 ....80.00
Houston,Tex. S5 .....62.00
Midland,Pa. C18 .....54.00
Munhall,Pa. U5 .....54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$56.00
Clairton,Pa. U5 .....56.00
Ensley,Ala. T2 .....56.00
Fairfield,Ala. T2 .....56.00
Fontana,Calif. K1 ....75.00
Gary,Ind. U5 .....56.00
Johnstown,Pa. B2 ....56.00
Lackawanna,N.Y. B2 ..56.00
Munhall,Pa. U5 .....56.00
So.Chicago,Ill. U5 ....56.00
So.Duquesne,Pa. U5 ..56.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$66.00
Buffalo R2 .....66.00
Canton,O. R2 .....66.00
Clairton,Pa. U5 .....66.00
Cleveland R2 .....66.00
Conshohocken,Pa. A3 ..73.00
Detroit R7 .....69.00
Ensley,Ala. T2 .....66.00
Fairfield,Ala. T2 .....66.00
Fontana,Calif. K1 ....85.00
Gary,Ind. U5 .....66.00
Geneva,Utah G1 .....66.00
Houston,Tex. S5 .....74.00
Johnstown,Pa. B2 ....66.00
Lackawanna,N.Y. B2 ..66.00
LosAngeles B3 .....85.00
Munhall,Pa. U5 .....66.00
Seattle B3 .....85.00
So.Chicago R2, U5, W14.66.00
So.Duquesne,Pa. U5 ..66.00
So.SanFrancisco B3 ...85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ...$70.00
Buffalo R2 .....70.00
Canton,O. R2 .....70.00
Canton,O.(29) T7 ....66.00
Conshohocken,Pa. A3 ..77.00
Detroit R7 .....73.00
Fontana,Calif. K1 ....89.00
Gary,Ind. U5 .....70.00
Houston,Tex. S5 .....78.00
Ind.Harbor,Ind. Y1 ...70.00
Johnstown,Pa. B2 ....70.00
Lackawanna,N.Y. B2..70.00
LosAngeles B3 .....90.00
Massillon,O. R2 .....70.00
Midland,Pa. C18 .....70.00
Munhall,Pa. U5 .....70.00
So.Chicago R2,U5,W14.70.00
So.Duquesne,Pa. U5 ..70.00
Struthers,O. Y1 .....70.00
Warren,O. C17 .....70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$82.00
Cleveland R2 .....82.00
Fontana,Calif. K1 ...103.00
Gary,Ind. U5 .....82.00
Massillon,O. R2 .....82.00
So.Chicago,Ill. R2 ....82.00
So.Duquesne,Pa. U5 ..82.00

SHEET BARS (NT)
Fontana,Calif. K1 ...$89.00

SKELP
Aliquippa,Pa. J5 .....3.45
Munhall,Pa. U5 .....3.35
Warren,O. R2 .....3.35
Youngstown R2, U5 ...3.35

WIRE RODS
AlabamaCity,Ala. R2 ..4.10
Buffalo W12 .....4.10
Cleveland A7 .....4.10
Donora,Pa. A7 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 .....4.90
Houston,Tex. S5 .....4.50
Johnstown,Pa. B2 .....4.10
Joliet,Ill. A7 .....4.10
LosAngeles B3 .....4.90
Minnequa,Colo. C10 ....4.35
Monessen,Pa. P7 .....4.30
No.Tonawanda,N.Y.B11 4.10
Pittsburg,Calif. C11 ....4.75
Portsmouth,O. P12 ....4.30
Roebling,N.J. R5 .....4.20
So.Chicago,Ill. R2 .....4.10
SparrowsPoint,Md. B2 ..4.20
Sterling,Ill.(1) N15 ....4.10
Struthers,O. Y1 .....4.10
Torrance,Calif. C11 ...4.90
Worcester A7 .....4.40

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..3.60
Aliquippa,Pa. J5 .....3.65
Bessemer,Ala. T2 .....3.65
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fairfield,Ala. T2 .....3.65
Fontana,Calif. K1 ....4.25
Gary,Ind. U5 .....3.65
Geneva,Utah G1 .....3.65
Houston,Tex. S5 .....4.05
Ind.Harbor,Ind. I-2 ....3.65
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.25
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.25
Minnequa,Colo. C10 ....4.10
Munhall,Pa. U5 .....3.65
Niles,Calif.(22) P1 ....4.85
Phoenixville,Pa. P4 ....4.95
Portland,Oreg. O4 .....4.50
Seattle B3 .....4.30
So.Chicago,Ill. U5, W14.3.65
So.SanFrancisco B3 ....4.20
Torrance,Calif. C11 ....4.25
Weirton,W.Va. W6 ....3.90

Alloy Stand. Shapes
Clairton,Pa. U5 .....4.35
Fontana,Calif. K1 .....5.55
Munhall,Pa. U5 .....4.35
So.Chicago,Ill. U5 .....4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.50
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa.(14) B2 .5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 ....6.10
Gary,Ind. U5 .....5.50
Geneva,Utah G1 .....5.50
Ind.Harbor,Ind. I-2 ....5.50
Ind.Harbor,Ind. Y1 ....6.00
Johnstown,Pa. B2 .....5.50
Lackawanna,N.Y.(14)B2 5.50
LosAngeles B3 .....6.05
Munhall,Pa. U5 .....5.50
Seattle B3 .....5.10
So.Chicago,Ill. U5 .....5.50
So.SanFrancisco B3 ....6.00
Struthers,O. Y1 .....6.00

Wide Flange
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fontana,Calif. K1 .....4.65
Lackawanna,N.Y. B2 ..3.70
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 .....3.65

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....5.50
Lackawanna,N.Y. B2 ..5.50
Munhall,Pa. U5 .....5.45
So.Chicago,Ill. U5 .....5.45

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.45
Lackawanna,N.Y. B2 ..4.45
Munhall,Pa. U5 .....4.45
So.Chicago,Ill. U5 .....4.45

BEARING PILES
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 .....3.65

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.65
Bessemer,Ala. T2 .....5.65
Clairton,Pa. U5 .....5.65
Cleveland J5, R2 .....5.65
Conshohocken,Pa. A3 ..5.90
Fairfield,Ala. T2 .....5.65
Fontana,Calif.(30) K1 ..6.25
Gary,Ind. U5 .....5.65
Geneva,Utah G1 .....5.65
Ind.Harbor,Ind. I-2 ....5.65
Ind.Harbor,Ind. Y1 ....6.15
Johnstown,Pa. B2 .....5.65
Munhall,Pa. U5 .....5.65
Pittsburgh J5 .....5.65
Seattle B3 .....6.55
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 .....5.65
SparrowsPoint,Md. B2 ..5.65
Warren,O. R2 .....5.65
Youngstown Y1 .....6.15

PLATES, Open-Hearth Alloy
Claymont,Del. W16 ....4.85
Coatesville,Pa. L7 ....5.25
Conshohocken,Pa. A3 ..5.05
Fontana,Calif. K1 .....5.70
Gary,Ind. U5 .....4.75
Johnstown,Pa. B2 .....4.75
Munhall,Pa. U5 .....4.75
Sharon,Pa. S3 .....5.20
So.Chicago,Ill. U5 .....4.75
SparrowsPoint,Md. B2..4.75

FLOOR PLATES
Cleveland J5 .....4.75
Conshohocken,Pa. A3 ..4.75
Harrisburg,Pa. C5 ....5.95
Ind.Harbor,Ind. I-2 ....4.75
Munhall,Pa. U5 .....4.75
So.Chicago,Ill. U5 .....4.75

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Ashland,Ky.(15) A10 ..3.70
Bessemer,Ala. T2 .....3.70
Clairton,Pa. U5 .....3.70
Claymont,Del. W16 ....4.15
Cleveland J5, R2 .....3.70
Coatesville,Pa. L7 .....4.15
Conshohocken,Pa. A3 ..4.15
Fairfield,Ala. T2 .....3.70
Fontana,Calif.(30) K1 .4.30
Gary,Ind. U5 .....3.70
GraniteCity,Ill. G4 ....4.40
Geneva,Utah G1 .....3.70
Harrisburg,Pa. C5 ....4.95
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Minnequa,Colo. C10 ....4.50
Munhall,Pa. U5 .....3.70
Pittsburgh J5 .....3.70
Seattle B3 .....4.60
Sharon,Pa. S3 .....3.95
So.Chicago,Ill. U5, W14.3.70
SparrowsPoint,Md. B2..3.70
Steubenville,O. W10 ...3.70
Warren,O. R2 .....3.70
Youngstown R2, U5, Y1.3.70

PLATES, Carbon A.R.
Fontana,Calif. K1 ....5.45
Geneva,Utah G1 .....4.85

PLATES, Wrought Iron
Economy,Pa. B14 .....8.60

PLATES, Ingot Iron
Asland,c.l.(15) A10 ...3.95
Ashland,lcl.(15) A10 ....4.45
Cleveland,c.l. R2 .....4.30
Warren,O. c.l. R2 .....4.30

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Alton,Ill.(1) L1 .....3.95
Atlanta,Ga. A11 .....4.25
Bessemer,Ala. T2 .....3.70
Buffalo R2 .....3.70
Canton,O. R2 .....3.70
Clairton,Pa. U5 .....3.70
Cleveland R2 .....3.70
Detroit R7 .....3.85
Emeryville,Calif. J7 ...4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2 Y1.3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.20
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 .....5.05
N.Tonawanda,N.Y. B11.3.70
Pittsburg,Calif. C11 ...4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
So.Chicago R2, U5, W14.3.70
So.Duquesne,Pa. U5 ...3.70
So.SanFran.,Cal. B3 ...4.45
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 ....4.40
Weirton,W.Va. W6 ....3.85
Youngstown R2, U5 ...3.70

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 .....3.70
Atlanta A11 .....4.25
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Niles,Calif. P1 .....5.05
Portland,Oreg. O4 .....4.65
SanFrancisco S7 .....4.85

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....4.30
Buffalo R2 .....4.30
Canton,O. R2 .....4.30
Canton,O.(29) T7 .....3.95
Clairton,Pa. U5 .....4.30
Detroit R7 .....4.45
Ecorse,Mich. G5 .....4.65
Fontana,Calif. K1 .....5.35
Gary,Ind. U5 .....4.30
Houston,Tex. S5 .....4.70
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....5.35
Massillon,O. R2 .....4.30
Midland,Pa. C18 .....4.30
So.Chicago R2, U5, W14.4.30
So.Duquesne,Pa. U5 ...4.30
Struthers,O. Y1 .....4.30
Warren,O. C17 .....4.30
Youngstown U5 .....4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.55
Gary,Ind. U5 .....4.55
Youngstown U5 .....4.55

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.55
Bessemer,Ala. T2 .....5.55
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.55
Cleveland R2 .....5.55
Fairfield,Ala. T2 .....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Ind.Harbor,Ind. I-2 ....5.55
IndianaHarbor,Ind. Y1..6.05
Johnstown,Pa. B2 .....5.55
Lackawanna,N.Y. B2 ...5.55
LosAngeles B3 .....6.25
Pittsburgh J5 .....5.55
Seattle B3 .....6.30
So.Duquesne,Pa. U5 ...5.55
So.SanFrancisco B3 ...6.30
Struthers,O. Y1 .....6.05
Youngstown U5 .....5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....4.55
BeaverFalls,Pa.M12,R2 ..4.55
Buffalo B5 .....4.60
Camden,N.J. P13 .....5.00
Carnegie,Pa. C12 .....4.55
Chicago W18 .....4.55
Cleveland A7, C20 ....4.55
Detroit P17 .....4.70
Donora,Pa. A7 .....4.55
Elyria,O. W8 .....4.55
FranklinPark,Ill. N5 ...4.55
Gary,Ind. R2 .....4.55
GreenBay,Wis. F7 .....4.55
Hammond,Ind. L2, M13.4.55
Hartford,Conn. R2 .....5.10
Harvey,Ill. B5 .....4.55
LosAngeles R2 .....6.00
Mansfield,Mass. B5 ....5.10
Massillon,O. R2, R8 ....4.55
Monaca,Pa. S17 .....4.55
Newark,N.J. W18 .....5.00
Plymouth,Mich. P5 .....4.80
Pittsburgh J5 .....4.55
Putnam,Conn. W18 .....5.10
Readville,Mass. C14 ....5.10
St. Louis,Mo. M5 .....4.95
So.Chicago,Ill. W14 ....4.55
SpringCity,Pa.(5) K3 ...5.00
Struthers,O. Y1 .....4.55
Waukegan,Ill. A7 .....4.55
Youngstown F3, Y1 ....4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....5.40
BeaverFalls,Pa. M12 ...5.40
Bethlehem,Pa. B2 .....5.40
Buffalo B5 .....5.40
Camden,N.J. P13 .....5.80
Canton,O. R2 .....5.40
Canton,O.(29) T7 .....4.90
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7 .....5.45
Cleveland C20 .....5.40
Detroit P17 .....5.55
Donora,Pa. A7 .....5.45
Elyria,O. W8 .....5.40
Gary,Ind. R2 .....5.40
Hammond,Ind. L2, M13.5.40
Hartford,Conn. R2 .....5.85
Harvey,Ill. B5 .....5.40
Lackawanna,N.Y. B2 ..5.40
Mansfield,Mass. B5 ....5.85
Massillon,O. R2, R8 ....5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.75
Plymouth,Mich. P5 .....5.60
So.Chicago,Ill. R2, W14.5.40
Struthers,O. Y1 .....5.40
Warren,O. C17 .....5.40
Waukegan,Ill. A7 .....5.45
Worcester,Mass. A7 ....5.75
Youngstown F3, Y1 ....5.40

RAIL STEEL BARS
ChicagoHts.(3,4)I-2, C2.4.75
Franklin,Pa.(3, 4) F5 ..4.75
FortWorth,Tex.(26) T4..5.40
Huntngtn,W.Va.(3) W7 .5.50
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....3.80
Tonawanda(3,4) B12 ...4.75
Williamsport(3) S19 ....5.00
Williamsport(4) S19 ...5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 15.00
Dover,(Eng.Bolt) U1 ..13.50
Dover(Wrgt.Iron) U1 .12.25
Economy,Pa.(S.R.) B14.9.60
Economy,Pa.(D.R.)B14 11.90
Economy(Staybolt)B14 12.20
McK.Rks.(Staybolt) L5.14.50
McK.Rks.(S.R.) L5 ...9.60
McK.Rks.(D.R.) L5 ..13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..3.70
Alton,Ill.(6) L1 .....3.70
Atlanta A11 .....4.25
Buffalo R2 .....3.70
Cleveland R2 .....3.70
Emeryville,Calif. J7 ...4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.30
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.20
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 .....5.05
Pittsburg,Calif. C11 ...4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
So.Chicago,Ill. R2 .....3.70
So.Duquesne,Pa. U5 ...3.70
So.SanFrancisco B3 ....4.45
SparrowsPoint,Md. B2 ..3.70
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 ....4.40
Youngstown R2, U5 ...3.70

BARS, Reinforcing (Fabricated; to Consumers)
Huntington,W.Va. W7 ..5.50
Johnstown, ¼-1" B2 ...4.75
LosAngeles B3 .....5.45
Marion,O. P11 .....5.00
Seattle B3, N14 .....5.55
So.SanFrancisco B3 ....5.45
SparrowsPt. ¼-1" B2..4.75
Williamsport,Pa. S19 ...5.10

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ..3.60
Ashland,Ky.(8) A10 ...3.60
Butler,Pa. A10 .....3.60
Cleveland J5, R2 .....3.60
Conshohocken,Pa. A3 ..4.00
Detroit M1 .....4.40
Ecorse,Mich.(8) G5 ....3.80
Fairfield,Ala. T2 .....3.60
Fontana,Calif. K1 .....4.55
Gary,Ind. U5 .....3.60
Geneva,Utah G1 .....3.70
GraniteCity,Ill. G4 ....4.30
Ind.Harbor,Ind. I-2, Y1.3.60
Irvin,Pa. U5 .....3.60
Lackawanna,N.Y. B2 ...3.60
Munhall,Pa. U5 .....3.60
Niles,O. N12 .....5.25
Pittsburg,Calif. C11 ....4.30
Pittsburgh J5 .....3.60
Sharon,Pa. S3 .....4.00
So.Chicago,Ill. W14 ....3.60
SparrowsPoint,Md. B2 ..3.60
Steubenville,O. W10 ...3.60
Torrance,Calif. C11 ....4.30
Warren,O. R2 .....3.60
Weirton,W.Va. W6 ....3.60
WestLeechburg,Pa. A4..3.75
Youngstown U5, Y1 ...3.60

SHEETS, H-R (19 gage)
AlabamaCity,Ala. R2 ..4.75
Dover,O. R1 .....5.65
Ind.Harbor,Ind. I-2 ....5.40
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.75
Torrance,Calif. C11 ....5.40

SHEETS, H-R (14-ga., heavier) High-Strength Low-Alloy
Cleveland J5, R2 .....5.40
Conshohocken,Pa. A3 ..5.65
Ecorse,Mich. G5 .....5.95
Fairfield,Ala. T2 .....5.40
Fontana,Calif. K1 .....6.35
Gary,Ind. U5 .....5.40
Ind.Harbor,Ind. I-2 ....5.40
IndianaHarbor,Ind. Y1..5.90
Irvin,Pa. U5 .....5.40
Lackawanna(35) B2 ..5.40
Pittsburgh J5 .....5.40
Sharon,Pa. S3 .....5.40
So.Chicago,Ill. U5 .....5.40
SparrowsPoint(36) B2 ..5.40
Warren,O. R2 .....5.40
Weirton,W.Va. W6 ....5.75
Youngstown U5 .....5.40
Youngstown Y1 .....5.90

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 .....6.55
Ecorse,Mich. G5 .....7.10
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.55
IndianaHarbor,Ind. Y1 .7.05
IndianaHarbor,Ind. I-2 .6.55
Irvin,Pa. U5 .....6.55
Lackawanna(37) B2 ...6.55
Pittsburgh J5 .....6.55
SparrowsPoint(38) B2 ..6.55
Warren,O. R2 .....6.55
Weirton,W.Va. W6 ....6.90
Youngstown Y1 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J5, R2	4.35
Ecorse,Mich. G5	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
GraniteCity,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala., R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10
Torrance,Calif. C11	5.10

BLUED Stock, 29 Ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23)F4	6.85

ROOFING SHORT TERNES (8 lb coated)

Gary,Ind. U5	9.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, Lt. Coated Ternes, 6lb

Yorkville,O. W10	8.40

SHEETS, Mfg. Ternes, 8 lb (Comercial Quality)

Gary,Ind. U5	9.50
Yorkville,O. W10	9.50

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

SHEETS, Culvert No. 16	Cu Alloy	Cu Fe
Ashland A10	5.60	...
Canton,O. R2	5.65	6.10
Fairfield,Ala. T2.	5.60	5.85
Gary U5	5.60	5.85
IndianaHarbor I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo C16	6.25	...
MartinsFy,O. W10	5.60	5.85
Pittsburg,Cal. C11	6.35	...
SparrowsPt. B2..	5.60	...
Torrance,Cal. C11	6.35	...

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom W10 (cut lengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill.G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths).	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	....	....	....
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	....	....	....
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

TIN PLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$8.45	$8.70
Fairfield,Ala. T2.	8.55	8.80
Gary U5	8.45	8.70
Ind.Har. I-2, Y1.	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11	9.20	9.45
Sp.Pt.,Md. B2	8.55	8.80
Warren R2	8.45	8.70
Weirton W6	8.45	8.70
Yorkville,O. W10.	8.45	8.70

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1.	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

STRIP, Hot-Rolled, High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Cal. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1.	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3.	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)S15	10.75
Carnegie,Pa. S18	10.60
Cleveland A7	10.00
Dover,O. G6	10.50
Fontana,Calif. K1	11.65
Harrison,N.J. C18	10.60
Midland,Pa. C18.	10.60
NewBritn,Conn.(10)S15	10.75
Pawtucket,R.I.(11) N8.	10.75
Pawtucket,R.I.(12) N8.	11.05
Sharon,Pa. S3	10.60
Worcester,Mass. A7	10.30
Youngstown C8	10.60

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill.(1) L1	3.75
Ashland,Ky(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt,Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1.	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32)B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.00
Minnequa,Colo. C10	4.55
NewBritain(10) S15	4.00
N.Tonawanda,N.Y. B11.	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.SanFrancisco B3	4.25
SparrowsPoint,Md. B2.	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4.	3.75
Youngstow U5, Y1	3.50

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgeprt,Conn.(10) S15.	5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40)T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle(40) E5	5.25
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) N8.	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8, (40)	5.25
Youngstown Y1	4.65

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10
Midland,Pa. C18	5.85
NewBritn,Conn.(10) S15	5.45
Sharon,Pa. S8	5.85
Youngstown U5	5.50

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	....
Carnegie,Pa. S18	...	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	...	....
Detroit D2	5.60	6.65	7.25	...	....
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18	...	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	....
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	...	....
NewYork W3	...	7.10	7.70	9.65	11.95
Pawtucket,R.I. N8: Cleve.-or-Pitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	...	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	6.80	7.40	9.35	11.65
Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork W3	...	...	10.30	12.50	15.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calif. Cold Rolled Steel
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve.Cold.Roll.Mills Co.
C8 Cold Metal Products Co.
C9 Cojonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire

G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H4 Heppenstall Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Koppers Co. Inc.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ...3.75
Warren,O. R2 .....4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....5.25

TIGHT COOPERAGE HOOP

Atlanta A11.....4.05
Riverdale,Ill. A1 .....3.90
Sharon,Pa. S3 .....4.15
Youngstown U5 .....3.75

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
AlabamaCity R2	5.70	5.95
Aliquippa J5	5.70	6.15
Atlanta A11	5.95	6.40
Bartonville(19)K4	5.70	6.15
Buffalo W12	4.85	...
Cleveland A7	5.70	6.15
Crawfordsville M8	5.95	6.40
Donora A7	5.70	6.15
Duluth A7	5.70	6.15
Fairfield T2	5.70	6.15
Houston,Tex. S5	6.10	6.55
Johnstown B2	5.70	6.15
Joliet,Ill. A7	5.70	6.15
KansasCy,Mo. S5	6.30	6.75
Kokomo C16	5.80	6.05
LosAngeles B3	6.65	...
Minnequa C10	5.95	6.45
Monessen P7	5.95	6.40
Palmer W12	5.15	...
Pitts.Calif. C11	6.65	6.80
Prtsmth.(18)P12	6.10	6.60
Rankin A7	5.70	6.15
So.Chicago R2	5.70	5.95
So.S.Fran. C10	6.65	7.10
SparrowsPt. B2	5.80	6.25
Sterling,Ill.(1)N15	5.70	6.15
Struthers,O. Y1	5.70	6.15
Torrance,Cal. C11	6.65	...
Worcester A7	6.00	6.45

WIRE (16 gage)	An'ld Stone	Galv. Stone
Aliquippa J5	10.15	11.85
Bartonville(1) K4	10.25	11.95
Cleveland A7	10.25	12.15
Crawfrdsvle M8	10.30	12.00
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.25	12.15
Kokomo C16	10.25	11.95
Minnequa C10	10.40	12.40
Palmer,Mass.W12	10.25	12.15
Pitts.,Cal. C11	10.60	12.50
Prtsmth.(18) P12	10.55	12.30
SparrowsPt. B2	10.35	12.25
Waukegan A7	10.25	12.15

ROPE WIRE	(A)	(B)
Bartonville,Ill. K4	8.55	8.80
Buffalo W12	8.55	8.80
Cleveland A7	8.55	8.80
Donora,Pa. A7	8.55	8.80
Fostoria,O. S1	8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7	8.80	9.05
NewHaven A7	8.85	9.10
Palmer,Mass. W12	8.85	9.10
Portsmouth,O. P12	8.55	8.80
Roebling,N.J. R5	8.85	9.10
SparrowsPt. B2	8.65	8.90
Struthers,O. Y1	8.55	8.80
Trenton,N.J. A7	8.85	9.10
Waukegan,Ill. A7	8.55	8.80
Worcester J4, T6	8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ...4.85
Aliquippa,Pa. J5 .....4.85
Atlanta A11 .....5.10
Alton,Ill.(1) L1 .....4.85
Bartonville,Ill.(1) K4 ..4.85
Buffalo W12 .....4.85
Chicago W13 .....4.85
Cleveland A7, C20 .....4.85
Crawfordsville,Ind. M8..5.10
Donora,Pa. A7 .....4.85
Duluth A7 .....4.85
Fairfield,Ala. T2 .....4.85
Fostoria,O.(24) S1 .....5.35
Houston S5 .....5.25
Johnstown,Pa. B2 .....4.85
Joliet,Ill. A7 .....4.85
No. Tonawanda B11....4.85
Palmer,Mass. W12 .....5.15
Pittsburg,Calif. C11.....5.80
Portsmouth,O. P12 .....5.25
Rankin,Pa. A7 .....4.85
So.Chicago,Ill. R2 .....4.85
So.SanFrancisco C10 ...5.80
SparrowsPoint,Md. B2 ..4.95
Sterling,Ill.(1) N15 ....4.85
Struthers,O. Y1 .....4.85
Torrance,Calif. C11 ....5.80
Waukegan,Ill. A7 .....4.85
Worcester,Mass. A7, T6..5.15

WIRE, Cold-Rolled Flat

Anderson,Ind. G6 .....6.20
Buffalo W12 .....6.35
Cleveland A7 .....5.85
Crawfordsville,Ind. M8..6.20
Detroit D2 .....6.20
Dover,O. G6 .....6.20
Fostoria,O. S1 .....6.00
Kokomo,Ind. C16 .....5.70
FranklinPark,Ill. T6 ...6.20
Massillon,O. R8 .....5.85
Monessen,Pa. P16 .....5.85
Monessen,Pa. P7 .....6.10
NewHaven,Conn. D2 ....6.50
Pawtucket,R.I.(12) N8..6.85
Trenton,N.J. R5 .....6.15
Worcester A7 .....6.15
Worcester T6 .....6.50
Worcester W12 .....6.65

WIRE, Fine & Weaving(8" Coils)

Bartonville,Ill.(1) K4 ...8.90
Buffalo W12 .....8.90
Chicago W13 .....8.90
Cleveland A7 .....8.90
Crawfordsville,Ind. M8..8.95
Fostoria,O. S1 .....8.90
Johnstown,Pa. B2 .....8.90
Kokomo,Ind. C16 .....8.90
Monessen,Pa. P16 .....8.90
Palmer,Mass. W12 .....9.20
Portsmouth,O. P12 .....8.90
Roebling,N.J. R5 .....9.20
Waukegan,Ill. A7 .....8.90
Worcester,Mass. A7, T6..9.20

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4 .....8.50
Monessen,Pa. P16 .....8.50
Roebling,N.J. R5 .....8.80
SparrowsPoint,Md. B2 ..8.25

WIRE, Tire Bead

Bartonville,Ill.(1) K4 ..10.90
Monessen,Pa. P16 .....11.40
Roebling,N.J. R5 .....11.55

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 .....6.25
Alton,Ill.(1) L1 .....6.25
Bartonville,Ill.(1) K4 ..6.25
Buffalo W12 .....6.25
Cleveland A7 .....6.25
Donora,Pa. A7 .....6.25
Duluth A7 .....6.25
Fostoria,O. S1 .....6.25
Johnstown,Pa. B2 .....6.25
LosAngeles B3 .....7.20
Milbury,Mass.(12) N6 ..8.05
Monessen,Pa. P7, P16..6.25
Palmer,Mass. W12 .....6.55
Pittsburg,Calif. C11 ....7.20
Roebling,N.J. R5 .....6.55
Portsmouth,O. P12 .....6.25
So.Chicago,Ill. R2 .....6.25
So.SanFrancisco C10 ....6.85
SparrowsPoint,Md. B2 ..6.35
Struthers,O. Y1 .....6.25
Trenton,N.J. A7 .....6.55
Waukegan,Ill. A7 .....6.25
Worcester A7, T6, W12..6.55
Worcester,Mass. J4 ....6.75

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....5.90
Alton,Ill.(1) L1 .....5.90
Buffalo W12 .....5.90
Cleveland A7 .....5.90
Donora,Pa. A7 .....5.90
Duluth A7 .....5.90
Johnstown,Pa. B2 .....5.90
LosAngeles B3 .....6.85
Monessen,Pa. P7, P16 ..5.90
NewHaven,Conn. A7 ....6.20
Palmer,Mass. W12 .....6.20
Pittsburg,Calif. C11 ....7.10
Portsmouth,O. P12 .....5.90
Roebling,N.J. R5 .....6.20
So.Chicago,Ill. R2 .....5.90
SparrowsPoint,Md. B2 ..6.00
Torrance,Calif. C11 ....7.10
Trenton,N.J. A7 .....6.20
Waukegan,Ill. A7 .....5.90
Worcester,Mass. A7 .....6.20

WOVEN FENCE, 9-15½ Ga. Col

AlabamaCity,Ala. R2 ...126
Ala.City,Ala.,17-18ga.R2 213
Aliquippa,Pa.9-14½ga.J5 130
Atlanta A11 133
Bartonville,Ill.(19) K4 ..130
Crawfordsville,Ind. M8 ..132
Donora,Pa. A7 130
Duluth A7 130
Fairfield,Ala. T2 130
Houston,Tex. S5 138
Johnstown,Pa. B2 130
Johnstown,17ga.,6" B2 ..204
Johnstown,17ga.,4" B2 ..207
Joliet,Ill. A7 130
KansasCity,Mo. S5 142
Kokomo,Ind. C16 132
Minnequa,Colo. C10 138
Monessen,Pa. P7 135
Pittsburg,Calif. C11 153
Portsmouth,O.(18) P12 ..137
Rankin,Pa. A7 130
So.Chicago,Ill. R2 126
Sterling,Ill.(1) N15 130

FENCE POSTS — **Col.**

ChicagoHts.,Ill. C2 140
Duluth A7 125
Franklin,Pa. F5 140
Huntington,W.Va. W7 ..140
Johnstown,Pa. B2 140
Marion,O. P11 140
Minnequa,Colo. C10 130
Moline,Ill. R2 136
So.Chicago R2 140
Tonawanda B12 140
Williamsport,Pa. S19 ...150

WIRE, Barbed — **Col.**

AlabamaCity,Ala. R2 ...136
Aliquippa,Pa. J5 140
Atlanta A11 143
Bartonville,Ill.(19) K4 ..143
Crawfordsville M8 145
Donora,Pa. A7 140
Duluth,Minn. A7 140
Fairfield,Ala. T2 140
Houston,Tex. S5 148
Johnstown,Pa. B2 140
Joliet,Ill. A7 140
KansasCity,Mo. S5 152
Kokomo,Ind. C16 142
Minnequa,Colo. C10 146
Monessen,Pa. P7 145
Pittsburg,Calif. C11 160
Portsmouth,O.(18) P12 ..147
Rankin,Pa. A7 140
So.Chicago,Ill. R2 136
So.SanFran.,Calif. C10..160
SparrowsPoint,Md. B2 ..142
Sterling,Ill.(1) N15 140

BALE TIES, Single Loop — **Col.**

AlabamaCity,Ala. R2 123
Atlanta A11 126
Bartonville,Ill.(19) K4 ..123
Chicago W13 123
Crawfordsville M8 132
Donora,Pa. A7 123
Duluth A7 123
Fairfield,Ala. T2 123
Joliet,Ill. A7 123
KansasCity,Mo. S5 135
Kokomo,Ind. C16 125
Minnequa,Colo. C10 128
Pittsburg,Calif. C11 147
So.Chicago,Ill. R2 123
So.SanFran.,Calif. C10..147
SparrowsPoint,Md. B2 ..125
Sterling,Ill.(1) N15 123

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2 ...6.10
Bartonville,Ill.(19) K4 ..5.95
Crawfordsville,Ind. M8 ..6.30
Donora,Pa. A7 .....5.95
Duluth A7 .....5.95
Johnstown,Pa. B2 .....5.95
Joliet,Ill. A7 .....5.95
Kokomo,Ind. C16 .....6.05
Minnequa,Colo. C10 ....6.20
Pittsburg,Calif. C11 ....6.90
Portsmouth,O. P12 .....6.25
Rankin,Pa. A7 .....5.95
So.Chicago,Ill. R2 .....6.10
SparrowsPoint,Md. B2 ..6.05
Sterling,Ill.(1) N15 ....5.65
Worcester,Mass. A7 ....6.25

NAILS, Cut (100 lb keg)
To dealers (33)

Conshohocken,Pa. A3 ..$7.35
Wheeling,W.Va. W10 ...7.15

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb Under
Bessemer,Pa. U5	3.60	3.50	3.55	4.00
Ensley,Ala. T2	3.60	3.50	...	4.00
Fairfield,Ala. T2	...	...	...	4.00
Gary,Ind. U5	3.60	3.50	3.55	...
Huntington,W.Va. W7	...	...	...	5.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55	...
Johnstown,Pa. B2	...	...	...(16)	4.00
Lackawanna B2	3.60	3.50	...	4.00
Minnequa,Colo. C10	3.60	3.50	...	4.50
Steelton,Pa. B2	3.60	3.50	...	...
Williamsport,Pa. S19	...	...	...	4.75

NAILS & STAPLES, Stock
To dealers & mfrs. (7) — **Col.**

AlabamaCity,Ala. R2 ...118
Aliquippa,Pa.(13) J5 118
Atlanta A11 121
Bartonville,Ill.(19) K4 ..118
Chicago,Ill. W13 130
Cleveland A9 125
Crawfordsville,Ind. M8 ..122
Donora,Pa. A7 118
Duluth A7 118
Fairfield,Ala. T2 118
Galveston,Tex. D7 126
Houston,Tex. S5 126
Johnstown,Pa. B2 118
Joliet,Ill. A7 118
KansasCity,Mo. S5 130
Kokomo,Ind. C16 120
Minnequa,Colo. C10 123
Monessen,Pa. P7 124
Pittsburgh,Calif. C11 137
Portsmouth,O. P12 124
Rankin,Pa. A7 118
So.Chicago,Ill. R2 118
SparrowsPoint,Md. B2 ..120
Sterling,Ill.(1) N15 118
Torrance,Calif. C11 138
Worcester,Mass. A7 124

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1..6.15
KansasCity,Mo. S5 .....6.40
Lebanon,Pa. B2 .....6.15
Minnequa,Colo. C10 ....6.15
Pittsburgh J5 .....6.15
Seattle B3 .....6.65
So.Chicago,Ill. R2 .....6.15
Struthers,O. Y1 .....6.15
Youngstown R2 .....6.15

TRACK BOLTS (20) Treated

KansasCity,Mo. S5 .....9.85
Lebanon,Pa.(32) B2 .....9.85
Minnequa,Colo. C10 ....9.85
Pittsburgh O3, P14 .....9.85
Seattle B3 .....10.10

TIE PLATES

Fairfield,Ala. T2 .....4.50
Gary,Ind. U5 .....4.50
Ind.Harbor,Ind. I-2 ....4.50
Lackawanna,N.Y. B2 ....4.50
Minnequa,Colo. C10 ....4.50
Pittsburg,Calif. C11....4.65
Seattle B3 .....4.65
Steelton,Pa. B2 .....4.50
Torrance,Calif. C11 ....4.65

JOINT BARS

Bessemer,Pa. U5 .....4.70
Fairfield,Ala. T2 .....4.70
Ind.Harbor,Ind. I-2 ....4.70
Joliet,Ill. U5 .....4.70
Lackawanna,N.Y. B2 ....4.70
Minnequa,Colo. C10 ....4.70
Steelton,Pa. B2 .....4.70

AXLES

Ind.Harbor,Ind. S18 ....5.60
Johnstown,Pa. B2 .....5.60

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts.Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RellanceDiv.,EatonMfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield,S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel

T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.

V2 Vanadium Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Corp.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W16 Worth Steel Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

TOOL STEELS

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	23.00	13.5W,4Cr,3V	140.00
Extra Carbon	27.00	18W,4Cr,2V,9Co	217.50
Spec. Carbon	32.50	19W,4Cr,2V,7Co	217.50
Oil Hardening	35.00	18.25W,4.25Cr,1V,4.75Co	185.50
Cr Hot Wrk	35.00	20.25W,4.25Cr,1.6V,12.25Co	323.00
Hi-Carbon-Cr	63.50	1.5W,4Cr,1V,8.5Mo	78.50
18W,4Cr,1V	123.50	6.4W,4.5Cr,1.9V,5Mo	87.00
18W,4Cr,2V	138.00	6W,4Cr,3V,6Mo	109.50

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M14, S8, U4, V2, V3.

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga & heavier.
(14) Also wide flange beams.
(15) ⅛" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. base.
(22) Del. San Fran. Bay area.
(23) 28 Ga, 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, to fabricators (elec. furn. billet, 5.40c); to consumers, 6.15c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Subject to 10% increase.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. edge or square edge.
(33) To jobbers, deduct 20 cents.
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	34.0	32.0	29.0	1.5	+0.5	+3.5
¼	6.0	0.42	28.5	26.5	23.5	+1.0	+3.0	+4.0
⅜	6.0	0.57	23.5	21.5	18.5	+7.0	+9.0	+12.0
½	8.5	0.85	36.0	34.0	35.0	14.0	12.0	13.0
¾	11.5	1.13	39.0	37.0	38.0	18.0	16.0	17.0
1	17.0	1.68	41.5	39.5	40.5	21.5	19.5	20.5
1¼	23.0	2.28	42.0	44.0	41.0	22.0	24.0	21.0
1½	27.5	2.78	42.5	41.5	41.5	23.0	21.5	22.0
2	37	3.68	48.0	41.0	42.0	23.5	21.5	22.5
2½	58.5	5.82	43.5	41.5	42.5	24.0	22.0	23.0
3	76.5	7.62	43.5	41.5	42.5	24.0	22.0	23.0

Column A: Etna, Pa. N2; Butler, Pa. ¼-⅜", F6; Benwood, W. Va., 3½ points lower on ⅛", 1½ points lower on ¼", and 2 points lower on ⅜", W10; Sharon, Pa. M6, 1 point higher on ¼", 2 points lower on ½" and ⅝"; following make ½" and larger: Lorain, O., N3; Youngstown R2 and 36½% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4". Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ⅛" through 3", Y1; Alton, Ill. (Gary base) L1.

Column D: Butler, Pa. F6, ⅛-⅜"; Benwood, W. Va. W10, except plus 3½% on ⅛", plus 2½% on ¼", plus 9% on ⅜"; Sharon, Pa. M6, plus 0.5 on ¼", 1 point lower on ½", ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1¼", 2", 2½" and 3". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, and 16½% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5 quotes 1 point lower on ¾", 2 points lower on 1", 1½ points lower on 1¼", 2 points lower on 1½" and 2", 1½ points lower on 2½" and 3"; Etna, Pa. N2 and 18½% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.6c	3.68	29.5	9.5	29.5	9.5
2½	58.5	5.82	32.5	12.5	32.5	12.5
3	76.5	7.62	32.5	12.5	32.5	12.5
3½	92.0	9.20	34.5	14.5	34.5	14.5
4	$1.09	10.89	34.5	14.5	34.5	14.5
5	1.48	14.81	37.0	17.0	37.0	17.0
6	1.92	19.18	37.0	17.0	37.0	17.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6 in.; Lorain, N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mil; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2½	12	26.92	32.97	26.98	31.76
2¾	12	29.65	36.32	29.57	34.76
2¾	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates Carbon Base 10%	Plates Carbon Base 20%	Strip Cold-Rolled Carbon Base Both Sides	Sheets Carbon Base 10%	Sheets Carbon Base 20%	Sheets Cu Base Both Sides
302	....	....	....	19.75	27.50	77.00
304	25.00	28.00–29.50	....	20.75–24.50	27.50	77.00
309	30.50	35.00	....	....	....	....
310	36.50	41.00	....	....	....	144.00
316	29.50	31.50–34.00	....	26.00	36.50	....
317	34.50	39.00	....	....	....	....
318	33.50	38.00	....	....	....	....
321	26.50	31.00	....	23.00	33.00	111.00
347	27.50	30.50–32.00	....	24.00	33.50	130.00
405	21.25	27.75	....	....	....	....
410	20.75	27.25	....	....	....	....
Nickel	33.25	44.25†	41.00	54.00	....	....
Inconel	41.00	53.50	....	....	....	165.00
Monel	34.75	45.75	....	....	....	....
Copper*	....	....	23.70†	29.65‡	....	....

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. W16, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, monel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:
- ½-in. & smaller diam. 15
- ⅝-in. & ¾-in. 18.5
- ⅞-in. and larger 17.5

Longer than 6 in.:
- All diams. 14

Lag bolts, all diams.:
- 6 in. and shorter 23
- over 6 in. long 21

Ribbed Necked Carriage 18.5
Blank 34
Plow 34
Step, Elevator, Tap, and Sleigh Shoe 21
Tire bolts 12
Boiler & Fitting-Up bolts 31

NUTS

	Reg.	Heavy
H.P. & C.P. Square:		
½-in. & smaller	15	15
⅝-in. & ¾-in.	12	6.5
⅞-in.-1½-in.	9	1
1⅝ in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ¾-in.	16.5	6.5
⅞-in.-1½-in.	12	2
1⅝ in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ¾-in.	23	17.5
⅞-in. & 1⅛-in.	19.5	12
1⅛-in. & larger	12	6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller	35	28.5
⅝-in. & ¾-in.	29.5	22
⅞-in.-1½-in.	24	15
1⅝-in. & larger	13	8.5
	Light	
½-in. & smaller	35	
⅝-in. to ¾-in.	28.5	
⅞-in. to 1½-in.	26	

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish .....48 & 10
Plated finishes....31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:
- ⅝-in. & smaller 42
- ¾-in. through 1 in. ... 34

Longer than 6 in.:
- ⅝-in. & smaller 26
- ¾-in. through 1 in. ... 4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter 38
1 in. and smaller diam. x over 6 in. 26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller 35
¼-in. diam. & larger.... 16
N.F. thread, all diams... 10

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 7.85c
⅞-in. under ..... 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..List to list-plus-50c.

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Diam. Inches	Length Inches	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95
4,5⅛	40	21.50
3	40	22.61
2½	24,30	23.15
2	24,30	25.36

CARBON

40	100,110	8.03
35	100,110	8.03
30	84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03
14	60,72	8.57
10,12	60	8.84

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.00	36.50	31.25
303	43.00	40.00	33.75
304	43.00	38.50	32.75
309	55.50	54.50	44.25
316	56.50	58.50	48.75
321	49.00	48.00	36.75
347	53.50	52.00	41.25
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Baltimore, Types 301 through 347 sheet, except 309 E2.

Brackenridge, Pa., sheets A4.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502 A10.

Carnegie, Pa., sheets and strip except Types 308, 416, 501 & 502, S18.

Cleveland, strip A7.

Detroit, strip, except Types 309, 321, 416, 420, 501 and 502 M1.

Dunkirk,N.Y., bars, wire A4.

Duquesne, Pa., bars U5.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip C18.

McKeesport, Pa., bars, sheets except Type 416 U5.

McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Pittsburgh, sheets C18.

Reading, Pa., bars and strip, except 55.50c for Type 309 strip and 44.75c for Type 309 bars, C4.

Sharon, Pa., strip, except Types 303, 309, 316, 416, 501 and 502 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars, U4.

Wallingford, Conn., strip, except 309, W2 quotes 0.25 cents higher.

Washington, Pa., bars, sheets & strip, except Type 309 sheets 56.00c and bars 44.75c, J3.

Washington, Pa., Types 301 through 347 sheets & strip as listed except 303 & 309; 316 sheets 61.50c, strip 63.00c, W4.

Watervliet, N. Y., structurals & bars A4.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4.

Youngstown, strip, except Types 303, 309, 316, 416, 501 and 502 C8.

COAL CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 30.00-35.00
Toluol, one deg...26.00-33.00
Industrial xylol ..25.00-33.50
Per ton bulk, ovens
Sulphate of ammonia..$32-$45
Cents per pound, ovens
Phenol, 40 (carlots, nonreturnable drums) ..17.25
Do., less than carlots..18.00
Do., tank cars 15.50

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

Sponge iron Cents
- 98 + % Fe, carlots.. 16.00
- Swedish, c.i.f. New York, in bags ..7.40-8.50

Electrolytic Iron:
- Annealed, 99.5% Fe. 42.50
- Unannealed, 99 + % Fe 36.50
- Unannealed, 99 + % Fe(minus 325 mesh) 58.50

Powder Flakes 48.50

Carbonyl Iron:
- 97.9-99.8%, size 5 to 10 microns..83.00-148.00

Aluminum:
- Carlots, freight allowed 29.50
- Atomized, 500 lb drums, freight allowed 33.50

Brass, 10-ton lots 30.00-33.25

Copper:
- Electrolytic 37.50
- Reduced 33.75-37.00

Lead 25.50

Manganese:
- Minus 100-mesh 57.00
- Minus 35 mesh 52.00
- Minus 200 mesh 62.00

Nickel unannealed 83.00

Nickel-Silver, 10-ton lots 44.00

Silicon 38.50

Solder (plus cost of metal) 8.50

Stainless Steel, 302 ....$1.25

Tin $1.69

Zinc, 10-ton lots..23.00-30.50

Tungsten: Dollars
- 99%, minus 80 to 200 mesh, freight allowed: over 1000 lb. 2.90
- 1000 lb 2.95
- Less than 1000 lb ... 3.00
- 98.8% minus 65 mesh, freight allowed: 1000 lb. and over... 4.15
- less than 1000 lb... 4.25

Molybdenum:
- 99%, minus 80 to 200 mesh, over 500 lb 2.85
- 200 to 500 lb 3.10
- less than 200 lb ... 3.25

Chromium, electrolytic 99% Cr min. 3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvil,fur. .$14.50-15.00
Connellsvil,fdry. .17.00-18.00
New River, foundry ...19.50
Wise county, foundry..15.95
Wise county, furnace..15.20

OVEN FOUNDRY COKE

Kearney, N. J., ovens.$22.75
Everett, Mass., ovens New England, del...†24.80
Chicago, ovens 21.00
Chicago, del. .....†22.45
Detroit, del. 24.91
Terre Haute, ovens...22.50
Milwaukee, ovens 23.75
Indianapolis, ovens ...22.75
Chicago, del. 26.62
Cincinnati, del. 25.67
Detroit, del. 26.65
Ironton, O., ovens ...21.50
Cincinnati, del. 24.06
Painesville, O., ovens..24.00
Buffao, del. 26.12
Cleveland, del. 25.72
Erie, Pa., ovens 23.50
Birmingham, ovens ...20.30
Birmingham, del. ...21.69
Philadelphia, ovens ...22.70
NevilleIsland,Pa.,ovens 23.00
Swedeland, Pa., ovens.22.00
St. Louis, ovens 24.25
St. Louis, del. 25.38
Portsmouth, O., ovens.21.50
Cincinnati, del. 24.06
Detroit, ovens 24.00
Detroit, del. *25.00
Buffalo, del. 27.04
Flint, del. 26.44
Pontiac, del. 25.39
Saginaw, del. 26.75

Includes representative switching charge of: *, $1.00; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡ Or within $4.15 freight zone from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140‡		Carbon	Floor
New York (city)	6.27	7.29	8.44	6.59	...	6.42	7.29	9.25	6.40	6.58	8.04
New York(c'try)	5.97	6.99	8.14	6.29	...	6.12	6.99	8.95	6.10	6.28	7.74
Boston (city) ..	6.40	7.20	8.49	6.35	...	6.25	7.04	9.25	6.40	6.98	7.88
Boston (c'try) .	6.20	7.00	8.29	6.15	...	6.05	6.84	9.05	6.20	6.78	7.68
Phila. (city) ..	7.15	7.05	8.25	6.35	...	6.30	7.11	8.90	6.15	6.30	7.40
Phila. (c'try) ..	6.90	6.80	8.00	6.10	...	6.05	6.86	8.65	5.90	6.05	7.15
Balt. (city) ...	5.80	7.04	8.27	6.24	...	6.24	7.09	...	6.34	6.00	7.64
Balt. (c'try) ...	5.60	6.84	8.07	6.04	...	6.04	6.89	...	6.14	5.80	7.44
Norfolk, Va. ..	6.50	...	...	6.70	...	6.55	7.70	...	6.60	6.50	8.00
Richmond, Va. .	5.90	...	8.10	6.10	...	6.10	6.90	...	6.30	6.05	7.80
Wash. (w'hse) .	6.02	7.26	8.49	6.46	...	6.46	7.26	...	6.56	6.22	7.86
Buffalo (del.) ..	5.80	6.60	8.29	6.06	...	5.80	6.65	10.65††§	6.00	6.25	7.55
Buffalo (w'hse).	5.60	6.40	8.09	5.86	...	5.60	6.45	10.45††§	5.80	6.05	7.35
Pitts. (w'hse) ..	5.60	6.40*	7.75	5.65-5.95	6.90	5.55	6.40	10.10††	5.70	5.75	7.00
Detroit (w'hse).	5.45-5.78	6.53-6.80	7.99	5.94-5.95	7.75	5.84	6.56	8.91	6.09	6.19-6.35	7.28
Cleveland (del.)	5.80	6.60	8.30	5.89	7.10	5.77	6.60-6.70	8.91	10.02	6.12	7.32
Cleve. (w'hse) .	5.60	6.40	8.10	5.69	6.90	5.57	6.40-6.50	8.71	5.82	5.92	7.12
Cincin. (city) ..	6.02	6.59	7.34	5.95	...	5.95	6.51	...	6.24	6.34	7.50
Chicago (city) .	5.80	6.60	7.95	5.75	...	5.75	6.50	10.30	5.90	6.00	7.20
Chicago (w'hse)	5.60	6.40	7.75	5.55	...	5.55	6.30	10.10	5.70	5.80	7.00
Milwaukee (city)	5.94	6.74	8.09	5.89	...	5.89	6.74	10.44	6.04	6.14	7.34
Milwau. (c'try).	5.74	6.54	7.89	5.69	...	5.69	6.54	10.24	5.84	5.94	7.14
St. Louis (del.).	5.68	6.48	7.28	5.63	...	5.63	6.28	10.08††§	5.78	5.93	7.13
St. L. (w'hse) .	5.48	6.28	7.08	5.43	...	5.43	6.08	9.88††§	5.58	5.73	6.93
Kans. City(city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
KansCity(w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Omaha, Nebr. ..	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Birm'hm (city) .	5.75	6.55	6.90§	5.70	...	5.70	7.53	...	5.85	6.10	8.25
Birm'hm (w'hse)	5.60	6.40	6.75§	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city)	6.55	8.10	9.05§	6.60	8.90	6.55	7.75	...	6.55	6.60	9.20
L. A. (w'hse) ..	6.35	7.90	8.85§	6.40	8.70	6.35	7.55	...	6.35	6.40	8.70
San Francisco..	6.65	7.80§	8.90§	6.60	...	6.45	8.20	...	6.45	6.50	8.60
Seattle-Tacoma .	7.05	8.60§	9.20§	7.30	...	6.75	9.10	11.15	6.65	6.75	8.80

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded; ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; §—500 to 1499 lb; §—450 to 1499 lb; §—3500 lb and over; §—1000 to 1999 lb.

REFRACTORIES

(Prices per 1000 bricks, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Hayward, Ashland, Ky., Clearfield, Curwensville, Pa., Ottawa, Ill., $116.60. Hard-fired, St. Louis, Vandalia, Mo., Olive Hill, Ky., $156.20.

High-Heat Duty: Salina, Pa. $99.60 Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, Curwensville, Lumber, Lockhaven, Pa., Olive Hill, Hitchins, Haldeman, Ashland, Ky., Troup, Athens, Tex., Stevens Pottery, Ga., Bessemer, Ala., Portsmouth, Oak Hill, O., Ottawa, Ill., $94.60.

Intermediate-Heat Duty: St. Louis, Farber, Vandalia, Mo., West Decatur, Orviston, Beach Creek, Curwensville, Lumber, Lockhaven, St. Marys, Clearfield, Pa., Olive Hill, Hitchins, Haldeman, Ashland, Hayward, Ky., Athens, Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $88; Bessemer, Ala., $79.20.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., $79.20; Parral, O., $78.50; St. Marys, Pa., $76; Ottawa, Ill., $70.

LADLE BRICK

Dry Press: Chester, New Cumberland, W. Va., Freeport, Merill Station, Clearfield, Pa., Irondale, Wellsville, O. $66.

Wire Cut: Chester, Wellsville, O., $64.

MALLEABLE BUNG BRICK

St. Louis, Vandalia, Farber, Mo., Olive Hill, Ky., $105.60; Beach Creek, Pa., $94.60; Ottawa, Ill., $90.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Portsmouth, O., Ensley, Ala., $94.60; Hays, Pa., $100.10; Joliet, Rockdale, Ill., E. Chicago, Ind., $104.50; Lehi, Utah, Los Angeles, $111.10.

Eastern Silica Coke Oven Shapes (net ton): Claysburg, Mt. Union, Sproul, Pa., Birmingham, $92.40.

Illinois Silica Coke Oven Shapes (net ton): Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $93.50.

BASIC BRICK

Per net ton, Baltimore or Chester, Pa. Burned chrome brick, $78-$78; chemical-bonded chrome brick, $77-$82; magnesite brick, $99-$104; chemical-bonded magnesite, $88-$93.

MAGNESITE

Per net ton, Chewelah, Wash. Domestic dead-burned, ⅜" grains; bulk, $36.30; single paper bags, $41.80.

DOLOMITE

Per net ton. Domestic, burned bulk; Bonne Terre, Mo., $12.15; Martin, Millersville, Narlo, Clay Center, Woodville, Gibsonburg, Bettsville, O., Billmeyer, Plymouth Meeting, Blue Bell, Williams, Pa., Millville, W. Va., $13.

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports.

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950 in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

EASTERN LOCAL ORE

Cents per unit, del. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	15.75
Brazilian iron ore, 68-69%	18.00

TUNGSTEN ORE

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$38-$39
Domestic scheelite, del.	nominal

MANGANESE ORE

Indian manganese, 46-48%, nearby, 92.00-96.00c per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 79.8-81.8c.

CHROME ORE

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

	Indian and African	
48%	2.8:1	$32.50
48%	3:1	35.00-36.00
48%	no ratio	26.00
	South African Transvaal	
44%	no ratio	$24.00-25.00
45%	no ratio	20.00
48%	no ratio	$31.00-32.00
50%	no ratio	28.00-28.50
	Brazilian	
44%	2.5:1 lump	$32.00
	Rhodesian	
45%	no ratio	$20.00-21.00
48%	no ratio	26.00
48%	3:1 lump	35.00-36.00
	Domestic—rail nearest seller	
48%	3:1	$39.00

MOLYBDENUM

Sulphide concentrates per lb, molybdenum content, mines	$0.90

FERROALLOYS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $75, Palmerton, Pa.; $75, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $185 per gross ton of alloy, c.l. packed, $197; gross ton lots, packed, $212; less gross ton lots, packed, $229; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., Welland, Ont., or Ashtabula, O. Base price: $187, Johnstown, Pa.; $185, Sheridan, Pa.; $188, Etna, Pa.; $190, Chattanooga, Tenn. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.ob. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $227; less gross ton lots, $244 f.o.b. Chicago. Add or subtract $2.30 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 25.75c per lb of contained Mn, carload packed 26.5c, ton lot 27.6c, less ton 28.8c. Delivered. Deduct 0.5c for max, 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max, 7% Si. **Special Grade:** (Mn 90% min., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max.). Carload, lump, bulk 19.15c per lb of contained Mn, carload packed 19.9c, ton lot 21.0c, less ton 22.2c. Delivered. Spot, add 0.25c.

Manganese Metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload lump bulk, 34c per lb of metal; packed, 34.75c; ton lot 36.25c; less ton lot 38.25c. Delivered. Spot, add 2c.

Manganese, Electrolytic: 250 lb to 1999 lb, 32c; 2000 to 39,999 lb, 30c; 40,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump bulk, 1.50% C grade, 18-20% Si 9.90c per lb of alloy, carload packed, 10.65c, ton lot 11.55c, less ton 12.55c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2 from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 21.75c per lb of contained Cr, c.l., packed 22.65c, ton lot 23.80c, less ton 25.20c. Delivered. Spot, add 0.25c.

"SM" Ferrochrome: (Cr 60-65% Si 4-6%, Mn

(*Please turn to page* 139)

More Bans on Metal Use Coming

Consumers exert increased pressure on suppliers whose expansion programs fail to keep pace with growing requirements for defense and essential civilian needs

LAY YOUR groundwork now to get into war production work if a "strategic" metal is used in your present product. You may be forced to curtail your civilian product operations sooner than it was expected a few weeks ago. A substitute material may be found, but its availability probably is becoming tighter as demand mushrooms from many directions.

Users of aluminum were jolted last week by the government's revision to its distribution order requiring producers to channel an overall average of 45 per cent of their base period production to defense work, effective Feb. 1. The previous limitation averaged about 25 per cent. The actual set-aside for DO orders for fabricators ranges from 30 per cent on rolled shapes to 60 per cent for forgings. Fabricators will be forced to revise their shipping schedules as rapidly as possible to comply with the new regulation. That means some aluminum sheets, bars, structurals, etc. promised for delivery as far ahead as April will not reach your plant; the material must be diverted to fill increasing defense needs. Future developments in the defense effort may force a further reduction in tonnages permitted for civilian goods.

End-Use Restrictions—That portion of aluminum production permitted for civilian goods will be restricted as to end use after Apr. 1. National Production Authority issued a list of more than 200 items in which aluminum may not be used. For the most part, they are comparatively unimportant tonnage-wise. There are about a dozen classifications, though, in which the tonnage has been growing steadily. These include: Storm windows; domestic laundry equipment; cleaning accessories; wire fencing; residential type roofing and siding; etc. Producers of those products in many instances had been forewarned of the restrictive action and had cut down where possible the amount of aluminum used in each unit produced; others have been preparing to use substitute materials, or negotiating for DO business.

Restrictions on end-uses became necessary despite an increase of 19 per cent in U. S. aluminum production last year, amounting to 1,437,255,518 pounds. Expansion plans of the industry will provide for an increase of 20 per cent this year and for an additional increase in 1952. Some 930 million pounds will be added to the industry's annual capacity by the end of 1952. But most of the metal so produced will be earmarked for defense orders or the national stockpile.

Aircraft will require the largest amount of aluminum used in military equipment. Other military applications developed during World War II are again coming to the fore, as well as a number of newer uses, some of which cannot be disclosed at this time, says Donald M. White, secretary, Aluminum Association, New York.

Expect Zinc Cuts by Apr. 1

Zinc die casters face the threat of an enforced sharp curtailment in operations about Apr. 1. Present restrictions on the use of zinc will be tightened by NPA by the date, banning use of the metal for decorative products and nonessential items. If your product is considered "functional" cut in operations will be less severe. The order will follow closely the pattern set up in the aluminum regulation.

Government officials are believed to be awaiting a wider acceptance by producers and consumers of the necessity for stricter restrictions before issuing the order. Several responsibe members of the zinc industry are urging a reconvening of their advisory committee to sponsor early action. They point out that zinc stocks held by smelters are at an all-time low, amounting to only about 9000 tons of which about 2000 tons are special high grade.

Lead Supplies Tightening

Look for a further tightening in availability of lead. As shortages in other metals force the metalworking industry to seek substitutes, demand for lead will broaden. Producers are receiving a larger volume of inquiry for March delivery, and the aggregate is far in excess of supply.

Brass Mills Feel Supply Pinch

Consumers of copper and brass products are having difficulty in covering minimum needs. No easing in this situation can be expected in the foreseeable future. Distributors' inventories in New England are sufficient to take care of no more than 40 per cent of present inquiry.

Decorative automotive accessories are in heavy demand with distributors of these items building up stocks against restrictions on supplies for manufacturing after Apr. 1. Only a few producers of accessories have defense contracts. The number of products has been reduced drastically in some instances to make inventories of material for fabrication stretch as far as possible.

Confusion over government regulations is slowing domestic output and importation of copper. Nonferrous scrap volume is off and secondary refiners of electrolytic copper are losing production.

Costume jewelry shops are operating at a high rate by use of an extra shift, building inventories against a cutoff of nonferrous metal supplies. Confronted with reductions in brass and other materials the jewelry industry is considering use of higher cost substitutes.

In leading copper and brass consuming areas in Connecticut, there is a lag in placement of defense orders. This, coupled with restrictions on the use of metal for many nonessential goods, threatens to open a gap in production schedules with layoffs and shorter hours. Eventually, large armament orders for copper and brass products will be forthcoming. Contrary to experience at the start of the last war, deficit in metal supplies confronts the industry. Additional facilities cannot be constructed to eliminate these deficits quickly.

Tin Market Remains Unsettled

Volume of tin sold by importers is off sharply. Lack of uniformity in sales policies add to the confusion. Reconstruction Finance Corp.'s price-sales policy differs from that of importers. Even among the latter, prices vary, depending upon what dates appear on actual sales orders. Importers hesitate to place orders abroad in the usual volume, being uncertain as to what price they can legally charge on new tin arrivals.

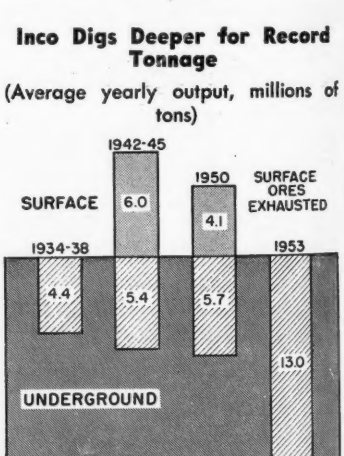
Nickel Output at Peacetime High

Production of nickel in Canada is at maximum capacity and is expected to be larger in 1951 than in any peacetime year. Additional supplies of the metal will be available from the United States government-owned nickel properties in Cuba which are being reactivated. Defense needs will absorb these additional tonnages, indicating you will witness a continuation of, if not a broadening in, present restrictions on end uses.

International Nickel Co. of Canada Ltd., Copper Cliff, Ont., reports "the military requirements of Canada, United States and United Kingdom are being met and deliveries are being made to government stockpiles." The Frood-Stobie open-pit ores, which enabled the company to achieve its high output during the war and postwar years, will be mined out soon. Full conversion to underground mining in 1953 is expected.

Inco Digs Deeper for Record Tonnage

(Average yearly output, millions of tons)



NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c. Conn. Valley; Lake 24.61½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 29.00c; 88-10-2 (No. 215) 43.25c; 80-10-10 (No. 305) 35.00c; No. 1 yellow (No. 405) 25.00c.

Zinc: Prime western 17.50c; brass special 17.75c; intermediate 18.00c, East St. Louis; high grade 18.60c, delivered.

Lead: Common 16.80c; chemical 16.90c; corroding 16.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 30.00-30.50c; No. 12 foundry alloy (No. 2 grade) 29.50-30.25c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 32.00c; grade 2, 30.00-30.25c; grade 3, 29.00-29.50c; grade 4, 28.50-29.00c. Prices include freight at c.l. rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt, 182.50c; Feb. 182.00c; Mar. 181.50c.

Antimony: American 99-99.8% and over but not meeting specifications below 42.00c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 42.50; f.o.b. Laredo, Tex., for bulk shipments. Foreign, 99%, nominal.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 50.50c; 25-lb pigs, 53.15c; "XX" nickel shot, 54.15c; "F" nickel shot or ingots, for addition to cast iron, 51.00c. Prices include import duty.

Mercury: Open market, spot, large lots, New York, $225 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b., Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.55 del.; special or patented shapes $2.80.

Cobalt: 97.99%, $2.10 per lb for 500 lb (kegs); $2.12 per lb for 100 lb (case); $2.17 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 90.16c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

Sheet: Copper 39.93-41.68; yellow brass 36.86-38.28; commercial bronze, 95%, 39.91-41.61; 90%, 39.48-41.13; red brass, 85%, 38.54-40.14; 80%, 38.12-39.67; best quality, 39.15; nickel silver, 18%, 50.57-51.91; phosphor-bronze grade A, 5%, 58.49-60.20.

Rod: Copper, hot-rolled 35.78-37.53; cold-drawn 37.03-38.78; yellow brass free cutting, 31.26-32.63; commercial bronze, 95%, 39.60-41.30; 90%, 39.17-40.82; red brass 85%, 38.23-39.83; 80%, 37.81-39.36.

Seamless Tubing: Copper 39.97-41.72; yellow brass 39.87-41.29; commercial bronze, 90%, 42.14-43.79; red brass, 85%, 41.45-43.05; 80%, 42.58.

Wire: Yellow brass 37.15-38.57; commercial bronze, 95%, 40.20; 90%, 39.77-41.42; red brass, 85%, 38.83-40.43; 80%, 38.41-39.96; best quality brass, 39.44.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 28.67-29.42, l.c.l. 29.17-29.92. 100,000 lb lots 28.545-29.295; weatherproof, f.o.b. eastern mills, c.l. 29.60, l.c.l. 30.10. 100,000 lb lots 29.35; magnet, del., 15,000 lb or more 34.50, l.c.l. 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders.)

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	R317-T4	—Hexagonal— 17S-T4
0.125	52.0	....	....
0.156-0.188	44.0	....	....
0.219-0.313	41.5	....	....
0.375	40.0	46.0	48.0
0.406	40.0	....	....
0.438	40.0	46.0	48.0
0.469	40.0	....	....
0.500	40.0	46.0	48.0
0.531	40.0	....	....
0.563	40.0	....	45.0
0.594	40.0	....	....
0.625	40.0	43.5	45.0
0.688	40.0	....	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	....	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	....	....
1.625	36.5	....	39.5
1.688-2.000	36.5	....	....

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $22.00 per cwt; add 50c cwt 10 sq ft to 140 sq. ft. Pipe: Full coils $22.00 per cwt. Traps and bends: List prices plus 60%.

ZINC

Sheets, 24.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 23.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 23.50-24.50c; over 12-in., 23.50-24.50c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 71.50c. Strip, cold-rolled, 77.50c. Rods and shapes, 67.50c. Plates, 69.50c. Seamless tubes, 100.50c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 57.00c. Strip cold-rolled 60.00c. Rods and shapes, 55.00c. Plates, 56.00c. Seamless tubes, 90.00c. Shot and blocks, 50.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill pate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over 27.50c; 1 to 5 tons 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 37.69c; oval 37.19c; cast 37.375c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 1000 lb 60.8c, under 1000 lb 62.8c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 19.00c; 1000 to 19,900 lb, 18.0c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 200 lb, 29.25c; over 200 lb 28.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 68.50c; 10,000 to 30,000 lb, 69.50c; 3000 to 10,000 lb, 70.50c, 500 to 3000 lb 71.50c; 100 to 500 lb, 73.50c; under 100 lb, 76.50c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 35.00c; 400-lb bbl. 33.00c up to 10,000 lb, 32.50c; over 10,000 lb, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; ball, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers nom.; 100 or 300 lb drums only, 100 to 500 lb, nom.; 600 to 1900 lb, nom.; 2000 to 9900 lb, nom.; f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c, 10 or more drums 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl. less than 2000 lb nom.; more than 2000 lb, nom., f.o.b. Carteret, N. J.

Stannous Chrolide (Anhydrous): In 400 lb bbl, nom.; 100 lb kegs nom., f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 20,000 lb, f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	23.00	23.00	22.25
Yellow Brass	20.125	19.875	18.75
Commercial Bronze			
95%	21.875	21.625	21.125
90%	21.75	21.50	21.00
Red brass			
85%	21.50	21.25	20.75
80%	21.375	21.125	20.625
Muntz metal	19.00	18.75	18.25
Nickel, silver, 10%	22.25	22.00	11.125
Phos. bronze, A	24.00	23.75	22.75

BRASS INGOT MAKERS' BUYING PRICES

(Cents per pound, delivered eastern refineries, carload lots)

No. 1 copper 21.50*; No. 2 copper 20.00*; light copper 19.00*; composition red brass 22.00-22.50; radiators 17.50-17.75; heavy yellow brass 17.75.

* Nominal.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 21.50*; No. 2 copper 20.00*; light copper 19.00*; refinery brass (60% copper) per dry copper content 19.50.

* Nominal.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 20.00; No. 2 18.50; light copper 17.25; No. 1 composition red brass 17.00-17.50; No. 1 composition turnings 16.50-17.00; mixed brass turnings 12.00-12.50; new brass clippings 17.50-18.00; No. 1 brass rod turnings 16.00-16.50; light brass 11.00; clean heavy yellow brass 14.50-15.00; new brass rod ends 16.50-17.00; auto radiators 14.50-15.00; cocks and faucets, 15.50-16.00; brass pipe 17.00-17.50.

Lead: Heavy 14.50-14.75; battery plates 8.75-9.00; linotype and stereotype 14.50-14.75; electrotype 12.75-13.00; mixed babbitt 12.25-12.50.

Zinc: Old zinc 11.00-11.25; new die cast scrap 10.75-11.00; old die cast scrap 8.00-8.25.

Tin: No. 1 pewter 63.00-65.00; block tin pipe 90.00; No. 1 babbitt 58.00-60.00.

Aluminum: Clippings 2S 19.00-19.50; old sheets 15.50-16.00; crankcase 15.50-16.00; borings and turnings 12.00-12.50.

DAILY PRICE RECORD

1951	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Feb. 1-8	24.50	16.80	17.50	182.50	19.00	42.00	50.50	90.16
Jan. Avg.	24.50	16.80	17.50	171.798	19.00	42.00	50.50	90.16
Jan. 29-31	24.50	16.80	17.50	183.00	19.00	42.00	50.50	90.16
Jan. 26-27	24.50	16.80	17.50	182.00	19.00	42.00	50.50	90.16
Jan. 25	24.50	16.80	17.50	183.00	19.00	42.00	50.50	90.16
Jan. 24	24.50	16.80	17.50	180.00	19.00	42.00	50.50	90.16
Jan. 23	24.50	16.80	17.50	178.00	19.00	42.00	50.50	90.16
Jan. 22	24.50	16.80	17.50	176.00	19.00	42.00	50.50	90.16
Jan. 19-20	24.50	16.80	17.50	175.50	19.00	32.00	50.50	90.16
Jan. 18	24.50	16.80	17.50	175.75	19.00	32.00	50.50	90.16
Jan. 17	24.50	16.80	17.50	176.00	19.00	32.00	50.50	90.16
Jan. 16	24.50	16.80	17.50	175.00	19.00	32.00	50.50	90.16
Jan. 15	24.50	16.80	17.50	172.00	19.00	32.00	50.50	90.16

NOTE: Copper; Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits ,del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, effective Feb. 7, 1951.

STEELMAKING SCRAP COMPOSITE

Feb. 8	$44.00
Feb. 1	48.00
Jan. 1951	46.33
Feb. 1950	27.52
Feb. 1946	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

No. 1 Heavy Melting Steel (Grade 1)

Basing Point	Dealer, Industrial	Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	40.00	42.00
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Point, Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 heavy melting steel) for other grades of steel scrap.

Open-hearth and Blast Furnace Grades

2. No. 2 Heavy Melting	—$2.00
3. No. 1 Busheling	Base
4. No. 1 Bundles	Base
5. No. 2 Bundles	— 3.00
6. Machine Shop Turnings	—10.00
7. Mixed Borings & Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Busheling	— 4.00
10. Cast Iron Borings	— 6.00

Electric Furnace and Foundry Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate Scrap	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate Scrap:	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
20. Foundry Steel, 2 feet and under	+ 2.00
21. Foundry Steel, 1 foot and under	+ 4.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free Turnings	— 3.00
24. Heavy Turnings	— 1.00

Special Grades

25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+10.00
29. Shafting	+10.00

Restrictions on Use

(1) Prices for Grades 11, 23 and 24 may be charged only when shipped to a consumer directly from an industrial producer of such grades; otherwise ceiling prices shall not exceed prices established for the corresponding grades of basic open-hearth and blast furnace scrap.

(2) Prices established for Grades 26 and 27 may be charged only when such grades are sold for use for chemical or annealing purposes; otherwise ceiling prices for such grades shall not exceed the price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price for such grade shall not exceed the ceiling price established for the corresponding grade of basic open-hearth.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.

(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts: Where iron content is 85% and over, $4; 75% and over, $6; less than 75%, $10.

(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 heavy melting steel less $15.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap.

2. No. 2 Heavy Melting Steel	—$2.00
3. No. 2 Steel Wheels	Base
4. Hollow Bored Axles	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel	— 6.00
9. Uncut Frogs, switches	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or steel, uncut	—6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
22. Uncut Bolsters & Side Frames	Base
23. Cut Bolsters & Side Frames	+ 3.00
24. Angle & Splice Bars	+ 5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses; otherwise, ceiling price for such grade shall not exceed ceiling price established for Grade 14.

(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling price for such grade shall not exceed ceiling price established for No. 1 heavy melting steel.

CAST IRON SCRAP

Ceiling price per gross ton for any of the following grades of cast iron scrap shall be the price shown in the following table, f.o.b. shipping point.

1. Cast Iron, No. 1 (Cupola Cast)	$49.00
2. Cast Iron, No. 2 (Charging Box Cast)	47.00
3. Cast Iron, No. 3 (Heavy Breakable Cast)	45.00
4. Cast Iron, No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery Cast	52.00

Restrictions on Use

(1) Ceiling shipping point or on-line price which a basic open-hearth consumer may pay for No. 1 cast iron, No. 1 wheels, clean auto cast or malleable shall be the ceiling price established for No. 3 cast iron.

(2) Ceiling shipping point or on-line price which any foundry consumer other than a malleable iron producer may pay for Grade 10 shall be the ceiling price established for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin which is allocated by the National Production Authority to a consumer, shall be as follows:

(1) For preparing into Grade No. 1, Grade No. 2 or Grade No. 3, $8.

(2) For hydraulically compressing Grade No. 4, $6 per ton; Grade No. 5, $8.

(3) For crushing Grade No. 6, $3.

(4) For preparing into Grade No. 25, $6.

(5) For preparing into Grade No. 19, $6.

(6) For preparing into Grade No. 12, Grade No. 13, Grade No. 14, or Grade No. 18, $10.

(7) For preparing into Grade No. 17 or Grade No. 21, $10.

(8) For preparing into Grade No. 16 or Grade No. 20, $10.

(9) For hydraulically compressing Grade No. 15, $8.

(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be as follows:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.

(2) For hydraulically compressing Grade No. 13, $6.

(3) For preparing into Grade No. 16, $4.

(4) For preparing into Grade No. 17, $5.

(5) For preparing into Grade No. 18, $7.

(6) For preparing into Grade No. 21, $4.

(7) For preparing into Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron shall be limited to the following:

(1) For preparing Grade No. 8 into Grade No. 7, $9.

(2) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and the consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless the consumer obtains prior written approval from OPS.

No preparation charge other than the charges set forth above may be made for the preparation of any grade of iron or steel scrap unless the consumer has secured prior written approval of such charges from OPS.

Commissions

No comissions shall be payable on sales made under this regulation except by a consumer to a broker for brokerage services rendered to the consumer . Where scrap is allocated by NPA other than from a government agency, the seller may designate a broker. Where scrap is allocated by NPA from a governmental agency, the consumer may designate a broker. In the event that a broker purchases iron or steel scrap for sale to a consumer, such consumer may pay such broker a commission not exceeding $1 per gross ton. The regulation specifies under what conditions the broker commission may be paid.

Unprepared Scrap

The term "unprepared scrap" shall not include such demolition projects as bridges, box cars or automobiles, which must be so priced that the prepared scrap will be delivered to the consumer within the established ceiling delivered prices.

For unprepared steel scrap other than materials suitable for hydraulic compression, the ceiling basing point prices shall be $8 per gross ton beneath the established ceiling price of the prepared base grades, No. 1 heavy melting or No. 1 railroad heavy melting steel.

For unprepared material which when compressed constitutes No. 1 bundles the ceiling basing point price shall be $6 per gross ton beneath the ceiling basing point price for No. 1 bundles; or when compressed constitutes No. 2 bundles the ceiling basing point price shall be $8 per ton beneath the ceiling basing point price for No. 2 bundles.

Any iron casting which cannot be broken with an ordinary drop into Grade No. 2 or Grade No. 1 may not be classified as Grade No. 3. Where such iron casting requiring blasting or other special preparation is sold to a consumer of scrap, the shipping point price for Grade No. 3 must be reduced by the amount of the additional charges required for preparation.

Premiums for Alloy Content

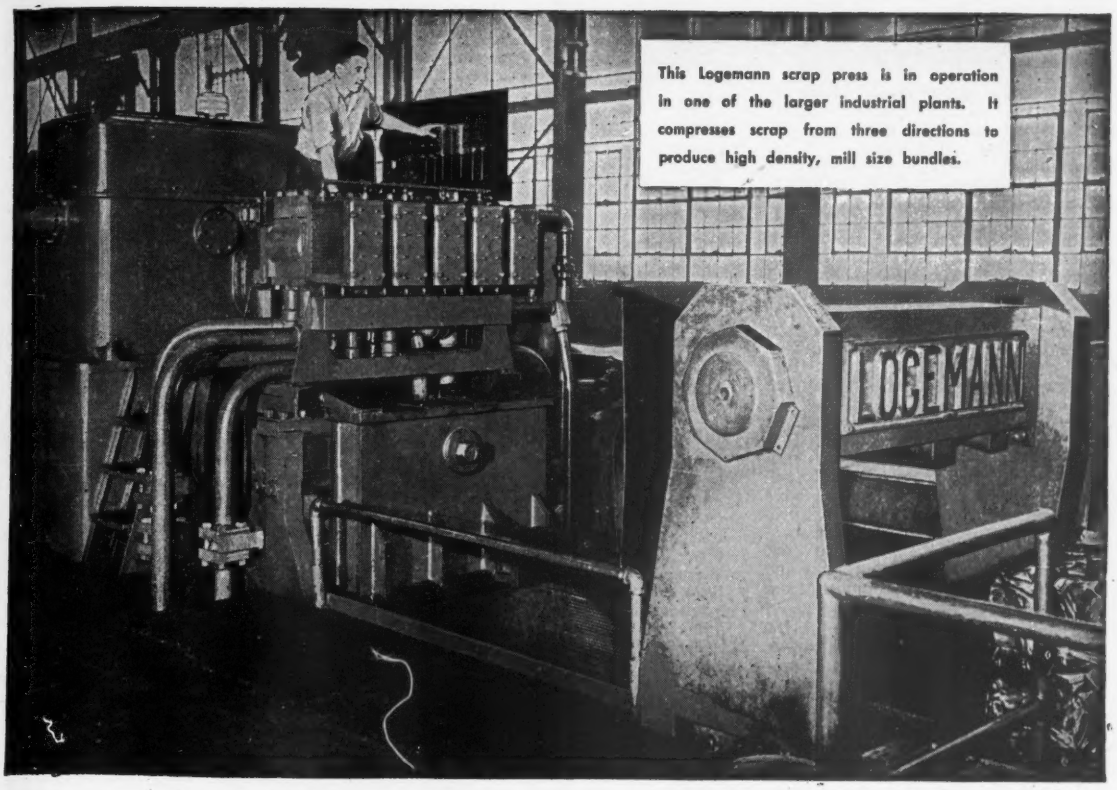
No premium, except those listed below, may be charged for alloys contained in iron and steel scrap. Except as outlined below the premiums are not confined to a particular use.

Nickel—A premium of $1.25 per gross ton for each 0.25 per cent may be charged in addition to the applicable ceiling price for No. 1 heavy melting steel where the scrap contains not less than .1 per cent and not over 5.25 per cent nickel.

Molybdenum—A premium of $2 per ton may be charged in addition to the applicable ceiling price for No. 1 heavy melting steel for scrap containing not less than 0.15 per cent molybdenum. A premium of $3 per ton may be charged in addition to the applicable ceiling price for No. 1 heavy melting steel for scrap containing not less than 0.65 per cent molybdenum.

Manganese—A premium of $4 per ton over the applicable basing point price for No. 1 heavy melting steel or No. 1 railroad heavy melting steel may be charged where scrap contains not less than 10 per cent manganese and is in sizes larger than 12 in. x 24 in. x 8 in. A premium of $14 per ton over the applicable basing point price for No. 1 heavy melting steel or No. 1 railroad heavy melting steel may be charged where scrap contains not less than 10 per cent manganese and is cut in sizes of 12 in. x 24 in. x 8 in. or smaller. These manganese premiums are only applicable if the scrap is sold for electric furnace use, except on allocation by NPA.

Chromium—Steel scrap conforming to SAE 52100 may command a premium of $1 per ton in addition to the applicable ceiling price for the corresponding grade when sold for electric furnace use only, but in no event shall the ceiling price plus the premium provided exceed the ceiling price for No. 1 heavy melting steel plus $1.



This Logemann scrap press is in operation in one of the larger industrial plants. It compresses scrap from three directions to produce high density, mill size bundles.

Self-contained.....
Triple Compression..
Automatically Controlled

LOGEMANN SCRAP PRESSES

handle high tonnages with minimum labor . . . at low cost!

LOGEMANN METAL BALERS

. . . are built in a large range of sizes to meet specific conditions. Let Logemann's engineering service help you arrive at the most efficient and economical way of handling your scrap.

The compact unit illustrated is completely self-contained with oil tank and pump located directly over the press . . . utilizing the advantages of short pipe lines. Automatic controls, mounted in front of pump, give the operator full visibility at all times. Controls operate rams successively within a single rigid box. There is no complex construction which means there is *no need for specially-trained maintenance crews.*

Both two-ram and three-ram models are available with automatic controls or for manual manipulation.

Logemann Bros. Co. have specialized in the production of scrap metal presses for sheet mills, stamping plants, scrap yards, and metal manufacturing plants of all types for nearly 75 years. Write for full information—please state the nature of your scrap and tonnage.

LOGEMANN BROTHERS COMPANY
3164 W. Burleigh Street • Milwaukee 10, Wisconsin

Sheets, Strip . . .

Sheet and Strip Prices, Page 119 & 120

Cleveland—Shipping difficulties attending the "sick" switchmen's strike are playing hob with sheet mill order scheduling. Republic Steel Corp. continues to operate its large continuous mill here despite the shutdown of open hearths and blast furnaces. Rollings are restricted to availability of semifinished stocks and when these are gone the mill will have to go down. Rail shipments out of the mill are completely shut off and the company is dependent for moving tonnage to consumers on availability of trucks. Sheet mills of the company in Warren, O., and Gadsden, Ala., are unaffected by the rail strike so far.

Sheetmakers have opened books for April on general customer tonnage and are accepting business into third quarter on DO account. April quotas for the general trade have been cut somewhat from those prevailing in March and the lost production now being experienced may cause still further quota cutbacks and substantial carryover tonnage from April to May.

Pittsburgh—There is little in the sheet and strip market situation to encourage commercial consumers' hopes for improvement in supply conditions over coming months. All the signs point to increased diversion of tonnage to defense and other emergency consuming channels as the weeks pass, and this, of course, will be at expense of regular customers. Most of the mills currently are booked into third quarter on hot-rolled and well through second quarter on cold-rolled for DO account. The "sick" switchmen's strike is hampering shipments into and out of the district with car shortage becoming increasingly acute. Production, however, is being maintained at high level, easing in weather conditions resulting in restoration of full gas flow to industrial plants.

Boston—Allocations for April outside of rated and directive tonnage for defense average 10 per cent under March. This holds for hot-rolled strip under nonintegrated producer quotas. Although DO volume to converters in numerous cases more than balances the loss in civilian tonnage, shortages in sheets and other flat-rolled items are becoming more acute with consumers of so-called tailor-made steel.

New York—Various restrictions on alloys, nickel, chrome and molybdenum in particular, are confusing producers of alloy sheets. Some claim they do not know what they can promise in the way of deliveries on stainless and other grades until the situation becomes clarified. Stainless producers indicate, however, they have little tonnage available for DO-rated orders in second quarter. Certain mills appear definitely into third quarter on such business.

Cincinnati — District sheet mills continue production close to capacity despite transportation difficulties. Stocks of acid are especially low. Outgoing shipments also are a problem, with choke point in storage near. Schedules are complete through March, that month showing the expected trend of progressively more tonnage for military and allied needs.

Birmingham — Several prospective new users of sheets here are awaiting word, that may not come, on availability. Their entry into the district is part of the current campaign for new industry, but DO orders and the hue and cry from established consumers, plus the ancient shortage, are contributing to the uncertainty.

Steel Bars . . .

Bar Prices, Page 119

Pittsburgh—Carbon bar sellers anticipate steady increase in defense requirements as mobilization picks up speed. While DO and other emergency tonnage still represent the smaller proportion of total volume entertained by the mills, such business is rising with corresponding tightening in supplies for the regular trade. Nonintegrated cold-finished bar makers are having difficulty getting all the hot bars they need, but they are continuing to operate at high levels for the reason they are assured steady flow of hot bars under allocation based on tonnage receipts in first nine months of 1950. Demand for alloy bars is increasing, most producers being booked through second quarter.

Boston—Despite an increase in defense order acceptance limitations, rated bar order schedules are one to two months beyond regular allocations for commercial use, the latter being April for hot-rolled carbon and alloy bars compared with May for DO bookings. Rated cold-drawn orders are booked well through June. Heavier volume of rated orders is lowering schedules for civilian tonnage. While forge shops are supplying a high percentage of priority volume, an increase in other directions is steady with negotiated contracts for shell quality cutting into hot-rolled openings.

New York—This week should see distribution of non-rated steel for April, and on a further restricted basis. Existing programmed allocations have been made for that month already, and DO-rated tonnage for not only that month but well beyond. Some mills are about booked up for the entire second quarter on military orders for hot carbon bars and into the third quarter on cold drawn carbon bars and alloy materials.

Philadelphia—Bar demand is expected to be accelerated sharply soon by a large shell program. Steel orders against this program may be on a DO-rated priority basis although requirements may be handled under directive allocations.

Cleveland — Further tightening in merchant bar supplies is indicated. Transportation and operating difficulties attending the cold weather at various points are intensifying tight supply conditions. Producers are booked well through second quarter on DO accounts but are just beginning to arrange schedules for April on regular commercial business. Bulk of tonnage by far still is going into commercial channels but the volume of defense and related requirements is steadily rising as more and more manufacturers get into the emergency production program.

Plates . . .

Plate Prices, Page 119

New York—Plate producers will soon set up schedules on non-rated orders for April, very likely on a more restricted scale than for March. Producers have set up allocations against existing emergency programs already as differentiated from the DO-rated business, and are well into May and in a few instances into June on the latter. Some action will probably be announced soon with regard to allocation programs for the locomotive, oil country goods and ship building industries. Production is at high pitch with increasing amount of strip plate capacity expected to be made available soon.

Philadelphia—Although plate producers are not booked as far ahead on DO-rated orders as sellers of some other steel products they are having to set aside a heavy amount of tonnage for emergency work. Existing allocated programs require substantially more plates than any other product and certain new programs will also. The 25 cargo ships just placed by the maritime administrator will require approximately 112,000 tons of hull steel of which 60 per cent will be plates. The 25 ships were divided equally among five yards at a total cost of $200,000,000, thus leaving $150,000,000 for additional ships on which action may come later.

Boston—Rated and directive tonnage accounts for close to 60 per cent of production with some plate mills, leaving shrinking balance for civilian allocations. April allocations, after earmarked volume, are from 10 to 15 per cent under March, and further reductions are indicated for May.

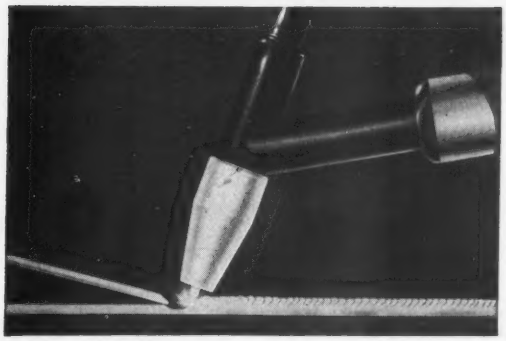
Pittsburgh—Increased defense and other emergency tonnage demand for plates is indicated in the offing. Several additional allocation programs are reportedly in the works which will substantially increase the load on the plate mills, already carrying a heavy tonnage on national emergency account. Proposed new programs include tonnage for locomotives, barges, pipelines, tank cars and ships, and are in addition to tonnages already earmarked, such as for freight cars. There is some uncertainty as to just how Washington will allocate these programs, but it is believed distribution in all probability will be on a month-to-month basis pending imposition of a Controlled Materials Plan. In such event, rolling schedules will be more or less fluid into July at least. Clarification of the outlook is expected about mid-February.

Birmingham — Plate users are searching for supplies, as usual. Some of them are picking up a few tons of plates here and there, but there is nothing certain about availability. With priorities on plates for an unprecedented volume of freight car construction, continued tightness and general confusion are expected to last indefinitely.

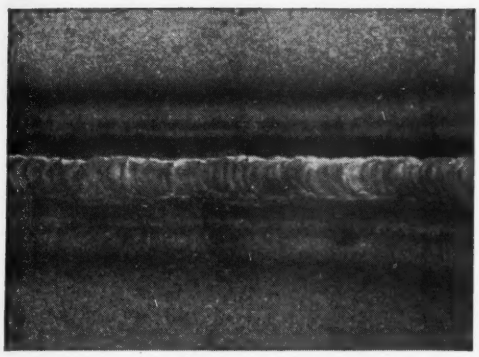
San Francisco—Plates generally are agreed to be among the "tightest" steel items in this area. Fabricators are scouring warehouses in attempts to bolster their supplies, but

Weld Sheet Steel with the HELIARC torch

Trade-Mark



and wipe out one complete operation



AS WELDED — *This photograph, unretouched and natural size, shows that* HELIARC *welds in sheet steel are clean and uniform.*

There is no spatter or flux, so you save cleaning costs when you switch to the HELIARC process for welding sheet steel. And you keep the advantages of high speed, and minimum distortion that are characteristic of arc welding. Any manual arc or gas welding operator finds welding with a HELIARC torch easy to master.

Porosity-free welds in killed low-carbon steel up to ⅛ in. thick can be made with this process. In non-killed grades, welds are as nearly gas free as can be produced by any welding process. Argon-shielding prevents pick-up of atmospheric gases. No argon is dissolved in the weld.

Joints welded with the HELIARC torch will not show under paint, lacquer, or even vitreous enamel finish. It takes only a light grinding to remove the low, smooth ripple and make the bead flush with the surface.

Get more information on this fast, clean, welding process from any LINDE office. Let us show you how it can improve your product and cut your costs. Just fill in the coupon.

The terms "Linde" and "Heliarc" are registered trade-marks of Union Carbide and Carbon Corporation.

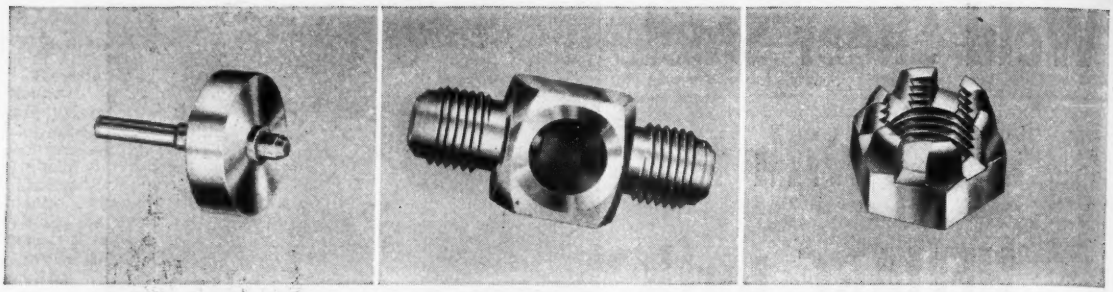
LINDE AIR PRODUCTS
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
Offices in Other Principal Cities
In Canada:
DOMINION OXYGEN COMPANY, LIMITED, Toronto

LINDE AIR PRODUCTS
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street, New York 17, N. Y.

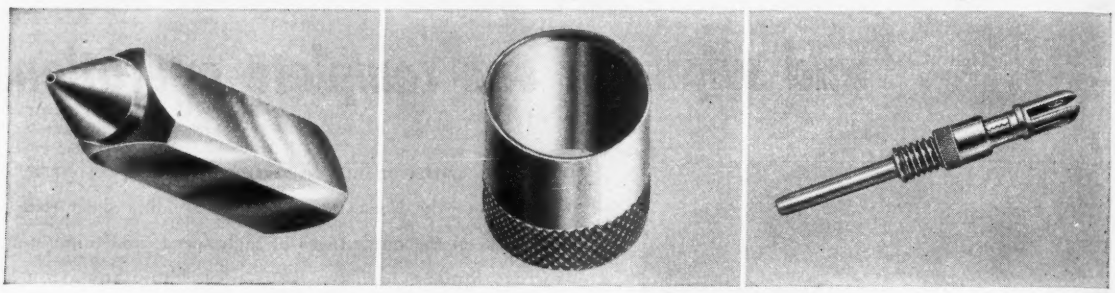
Gentlemen: We would like more information on welding sheet steel with the HELIARC torch. We manufacture ..... (Product)
from ..... (Metal) of ..... (Thickness)
We are ☐ (are not ☐) now using inert gas-shielded welding

Name.....Position.....
Company.....
City.....State.....

DEPARTMENT OF TECHNOLOGY
BUFFALO PUBLIC LIBRARY



Better Finishes . . . Faster Speeds . . . or Fewer Rejects



Reported on Each of These Jobs

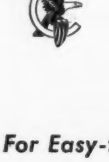
produced from *Carpenter* Free-Machining Stainless

These are not unusual job records. The reason for performance records such as 10% faster machining and 5% to 8% fewer rejects is the *constant uniformity* of Carpenter Free-Machining Stainless. Every bar, on shipment after shipment of Carpenter Stainless, responds the same when it meets your cutting tools.

Under today's conditions, it is important that you get every possible finished part from the Stainless Steel you buy. To do that . . . to find new ways to turn Stainless jobs out faster and better . . . make use of the personal shop help your Carpenter representative can give you. He will be glad to work with you and your men, to make his experience stretch the available supply of Stainless Steel.

Another help Carpenter can give you is useful information about machining Stainless. For example, the Carpenter "NOTEBOOK on Machining Stainless Steels" covers turning, drilling, reaming, lubrication, etc. If you would like a copy, just send us a note on your company letterhead, indicating your title.

The Carpenter Steel Company, 139 W. Bern St., Reading, Pa.
Export Department: The Carpenter Steel Company, Reading, Pa. "CARSTEELCO".



Carpenter

STAINLESS STEEL

takes the problems out of production

For Easy-to-Use Stainless Call Carpenter. Warehouses in principal cities throughout the country.

with little or no success. Mills are said to be distributing a fair share of the quota among plate fabricators, but for most it is not enough, relative to the number of jobs on fabricators' books.

Seattle—Small plate shops, lacking defense priorities, are making the best of a difficult situation. Considerable tonnage is involved in terminal improvements by the major oil companies in this area.

Tin Plate . . .

Tin Plate Prices, Page 120

Pittsburgh—Further restrictions on use of tin plate are expected in second quarter, including the ordering of lighter coatings for cans. Recently NPA issued five orders restricting use in numerous products, including cans, closures ahd collapsible tubes. Significant development of the past week was announcement by Weirton Steel Co., Weirton, W. Va., it had perfected a new electro-tinplating process that will result in pig tin savings of from 25 to 50 per cent. Tin plate by this new method is plated on one side with the amount of tin required to protect the contents of a can, but the other side is coated with only the amount of tin needed to protect cans from exposure. Under old practice the same weight of coating is applied to both sides of the plate. Thomas E. Millsop, president of Weirton, states the company is offering the new tin plate to customers. No special pricing of the product is involved.

Tubular Goods . . .

Tubular Goods Prices, Page 122

Boston—Directly rated orders for tubing are heavier than for steel pipe with both increasing. Merchant pipe allocations for April delivery to distributors are lower, the tonnage in most instances being well below that supplied under former voluntary quotas. After defense, essential program and warehouse orders are entered, pipe tonnage remaining for distribution is limited. One large producer blanked out March and some mills are one to two months behind on shipments. Utilities are feeling out prospects for better than 5000 tons for lead-in requirements in connection with natural gas line installations. Power plant piping is expected to be given a DO rating shortly.

Pittsburgh—Serious loss of pipe tonnage is being experienced as result of the switchmen's strike. Closing down of National Tube Co.'s Lorain Works by the walkout of the railroad men is costing 6000 tons of steel daily, equivalent to 23 miles of 20-in. pipe, or enough to drill 100 oil wells. The McKeesport works of the company was not affected by the walkout but the growing shortage of cars throughout the general area presents a serious threat to maintenance of production schedules.

Cleveland — Between the switchmen's strike and severe weather conditions producers of pipe in this area are having a difficult time maintaining production. National Tube Co.'s big plant at Lorain is down because of the tieup in transportation. Some 6000 tons of steel production are being lost at this plant daily, sufficient tonnage to produce 23 miles of 20-in. pipe. At the same time Republic Steel Corp. operations in the Youngstown area are hampered by the cutting off of industrial gas supplies due to the return of cold weather. The lost production will intensify already tight supply conditions in the pipe market, further delaying shipments to consumers in critical need of supplies, such as the petroleum industry.

Seattle—Cast iron pipe is in improved demand, but agencies of eastern and southern plants are handicapped by slow delivery. Consequently, all bid calls include alternatives and competing types of pipe have been awarded in increasing tonnages.

Structural Shapes . . .

Structural Shape Prices, Page 119

New York—Word that Charles E. Wilson, defense mobilization director, has notified Governor Dewey little or no structural steel will be available for public works except schools and hospitals after midyear has cast a pall on the outlook for large bridge and road-building construction, notably the state Thruway program.

Boston—Fabricated structural steel prices, based on the same margin of profit prevailing before the freeze, are somewhat more stabilized, depending on type of work, tonnage, engineering and plain material costs. As a result, quotations vary widely among shops, higher levels being indicative of premiums paid for plain material. New inquiry is lower with a substantial forward volume being estimated. Completion of the Central Arterial highway, Boston, requiring 50,000 tons, has been advanced from 2½ years to 18 months with priority.

Philadelphia — Structural awards are scattered, and while there is a fair volume of new demand, most inquiries are small. Extended delivery promises of fabricators and uncertainty as to the scope of government limitations on steel for construction purposes as time goes on are having a retarding effect on demand. However, there is considerable industrial work in prospect.

Pittsburgh—Structural shape producers report booking on DO account and emergency delegations extend well into June. Fabricators are pressing for tonnage but are not having much success in getting their needs satisfied. Curb on nonessential building is not expected to materially ease supply conditions since emergency programs, such as new steel mill construction, promise to more than take up any slack in demand that results from cutting off strictly commercial work. Recent awards include 138 tons to the American Bridge Co. for a bridge in Wabasha County, Minn.

Cleveland — Structural fabricators report increasing stringency in structural shape supplies. Curb on certain types of construction has not materially altered the supply situation and licensing of building after Feb. 15 is not expected to affect conditions greatly.

Wire . . .

Wire Prices, Page 121

Boston—Requests for rated tonnage in some ranges are in excess of regular allocations and far heavier than limitation set-aside. In some instances where this wire is known to be urgently needed for armament, acceptance limitation is waived and the order entered. Quotas for civilian uses are narrowing while restrictive orders on tin and zinc are reducing processing of grades involving these metals. Lighter coatings are given some steel in this category. Rod supply is tighter. Spring wire orders are screened and allocations reduced.

Chicago — Wiremakers report demand for bale ties is unseasonably high and a similar situation exists for nails. Part of the pressure originates from fear of critical shortages.

Birmingham—When demand for one wire product eases, another immediately takes up the slack. Result is that wire users, especially those in rural districts, are hard pressed for a reasonable supply. Nails and fencing are acute, and manufacturers' wire is somewhat less stringent, but far from plentiful.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 119

Chicago—Restriction on commercial construction until Feb. 15, after which NPA licenses will be required, appears to have shelved many small jobs which have been confronting reinforcing steel suppliers. Industrial construction is expanding at a rate that will more than offset the commercial hold up. Lack of steel is forcing suppliers to entertain inquiries with caution.

Seattle—Bar mills in this area have backlogs to the end of the second quarter. While building restrictions are hampering potential private construction, demand from public works is insistent and many important projects are up for early award, much of it military installations in Alaska. Peak operations are reported and will continue provided scrap supplies are available.

Semifinished Steel . . .

Semifinished Prices, Page 119

Detroit—Wildcat strike idled 1600 men in Great Lakes Steel Corp.'s openhearth department last Tuesday and resulted in the loss of approximately 3300 tons of ingots. Other departments were not affected. Disruption was caused by dissatisfaction over handling of a grievance.

Chicago — Through last midweek steel ingot production lost on account of the railroad switchmen's strike was estimated close to 50,000 tons. Plants hardest hit are United States Steel Co. and Wisconsin Steel Co. The former had banked four blast furnaces at its South Chicago works but subsequently restored two. Several finishing mills at South and Gary are idle. Wisconsin returned to operation two blast furnaces banked at start of the strike. However, all three stacks at the plant are on slow wind.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 122

Pittsburgh—Both beehive and oven coke producers last week were asking: "Will we be permitted to raise prices to compensate for the latest increase in coal?" No one here had the answer. The fact the coal price regulation appears to completely ignore coke leaves producers of the latter in a quandary on pricing policy. Pending clarification coke men say they will have to continue prices established early in January. Demand for oven coke is strong but some slight easing in pressure is noted attributable to inability of foundries to get all the iron they need to expand operations.

Chicago — If the railroad switchmen's strike continues into this week —Feb. 12—a number of foundries will be out of coke and curtailment or shut down will be necessary. The fuel situation is more serious than that of pig iron or scrap. Foundries outside the Chicago switching district have been more fortunate in receiving coke shipments.

Pig Iron . . .

Pig Iron Prices, Page 118

Cleveland—Foundries are operating generally on a 5-day week basis with a sprinkling reported on 6 days. Many shops would like to go to the 6-day week, but problems of pig iron, coke, and alloy supply are presented which make widespread adoption of the longer workweek in the immediate future doubtful. For one thing, the matter of labor's position is a factor, many workers insisting on the short week.

Pig iron supply is tight but is adequate to support foundry operations at current levels. Merchant sellers are doing everything possible to equitably distribute available tonnage and with foundry inventories held to 30 days everyone appears to be getting a steady flow of iron at least on a restricted basis. Foreign iron is helping some shops to overcome the shortage of domestic material. Currently, foundries producing alloy castings are hampered by the shortage of alloys, particularly nickel and molybdenum.

Boston—Although a few consumers with inventories in excess of 30 days are slowing down shipments, most melters are taking all iron available from district furnace and outside points. Melt is gradually increasing and some shops are inquiring as to coverage against heavier defense orders. Demand for silvery iron is steady, but producers are reluctant to add new commitments. Some silvery is being mixed with imported iron. Foreign purchases of basic have been made around $70, f.a.s.

New York—Demand for domestic pig iron exceeds supply. Production at district foundries has not been restricted, however, due to greater use of scrap and ferroalloys and also to some extent to increasing importation of foreign iron. Most foundries are on a 5-day week basis, with order backlogs increasing. Eventually a 6-day week schedule will be necessary at virtually all shops and will go on that basis if raw material, especially pig iron, can be had in adequate supply. At present only a relatively few foundries are on the more extended schedule.

Philadelphia—Shortage of pig iron was further emphasized last week by the scarcity of freight cars, due to the rail strike. Embargoes were being lifted during the latter part of the week but there is considerable accumulated tonnage to be moved.

Pittsburgh—The "sick" switchmen have gummed up the works for pig iron producers in this area. Shortage of cars resulting from the wildcat strike is seriously slowing down shipments into and out of plants. Blast furnace operations were being maintained but shipments out of some plants were off as much as 40 per cent and getting worse. Some furnaces that had been producing iron for the general market temporarily were diverted to production of hot metal and special irons. Coal and other heavy raw materials were coming into plants by water.

Buffalo—Large quantities of merchant pig iron were piled on the ground last week because of the railroad situation. Shippers reported a scarcity of cars was in evidence even before the strike. A number of foundries are pressing for deliveries to maintain production. Sellers, however, are reluctant to use trucks because of inadequate loading facilities.

Cincinnati—Shipments of pig iron into this district have showed to a point where foundries are concerned about ability to hold the melt at recent levels.

Chicago—Inventories of pig iron have been sufficient to keep foundries operating without serious curtailment during the switchmen's strike. However, if the paralysis continues to Feb. 12, many shops will be in trouble. Currently 37 of the district's 42 blast furnaces are operating. Wisconsin Steel Co., which banked two stacks on Jan. 29, has restored them but all three of the plant's furnaces are on slow wind. United States Steel Co. banked four furnaces at its South works but two have resumed.

Birmingham—Merchant iron melters continue to be besieged with inquiries. Since their order books are full, as they have been for months, new bookings are comparatively light. A program to boost pig iron production through furnace modernization programs, new coke ovens and otherwise will not help the situation for some months.

Seattle—No domestic pig iron is being used here. Buyers have considerable foreign iron on order, but deliveries are behind schedule because of scarce steamship space.

Scrap . . .

Scrap Prices, Page 126

Pittsburgh—Government rollback of scrap prices is being taken in stride by the trade here. Ceiling prices are pretty much in line with expectations. While the reductions are relatively sharp, approximately $6.50 per ton on No. 1 heavy melting steel, the ceiling of $44 plus $1 brokers' commission is only $1.50 under the open market price prevailing early in January. Actually the $51.50 price prevailing recently was in effect only about two weeks or so.

In the period between announcement of the ceilings and the effective date, Feb. 7, scrap yards worked feverishly to get out as much tonnage as possible at the higher prices before the deadline. Substantial tonnage was moved though freight car shortage attending the switchmen's strike presented a serious handicap. Whether the yards have been denuded of material to such point a severe shortage will be experienced pending replenishment remains to be seen. Some trade authorities think supplies will be short for some time, especially since winter weather will adversely affect collections and preparation.

Uncompleted contracts at the Feb. 7 deadline took the new ceiling prices. Surprisingly, few dealers are critical of the government move and as a general thing steelmakers appear satisfied. Several indicate early re-entrance to the market as active buyers. The new ceilings are said to be sufficiently high to encourage collections and should the government effect an allocation program for scrap assuring all consumers of a constant flow of material, reported under consideration, market stability to a high degree is believed certain to be achieved.

Cleveland—Movement of scrap is expected to pick up soon. Shipments are hampered now by the switchmen's strike which forced a shutdown of the largest mill here and in Lorain and prevented the free movement of cars into yards. Chief objection of dealers to provisions of the price regulation centers around cancellation of old orders. This results in a substantial financial loss to some firms. The working margins provided for the various interests in the market are sufficient to sustain present activity.

Philadelphia — Transition to the new government price schedule on scrap was made with a minimum of confusion. The trade in general knew that a rollback was in the offing and provided for cancellation of contracts just prior to the effective date and their renegotiation. Some shippers were adversely affected by the rail embargo due to the rail strike. They couldn't get cars to move material before the new schedules went into effect. However, in general no great losses were suffered.

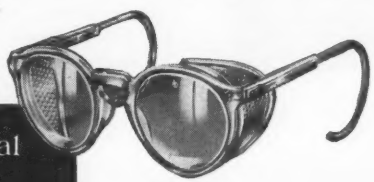
Differentials on some items came in for disfavor by the trade. For instance, differentials on machine shop turnings of $10 under base and on mixed borings and short turnings and shoveling turnings of $6 were considered out of line. Normally machine shop turnings and mixed borings and turnings are on a parity with each other and shoveling turnings are up $2 or $3 a ton over the other grades. This may create hardship in some cases. One pig iron producer who normally is a heavy consumer of shoveling turnings may find that he will be unable to obtain this material under the circumstances as extra screening is necessary.

Differentials on railroad specialties came in for some criticism also, carriers appearing to be particularly dissatisfied with the $7 differential on rerolling material. Some say they

Management and Labor BOTH agree that the High Cost of EYE ACCIDENTS Can be Cut—NOW!

Eye Accidents Cost $160,000,000 in LOST MAN HOURS*

In these days of accelerated production, what to do about other high costs may be debatable, but the wisdom of preventing eye accidents and their high costs is clearly apparent by simple arithmetic. A goggle representing an investment of about $2.30 can prevent a four figure claim . . . keep an experienced man on the job instead of a novice . . . protect the valuable machine he works on (as well as the man) . . . keep volume up and rejects down. Add the direct savings in medical care, first aid, and the indirect benefits of improved morale, and the case for an AO Eye Protection Program is overwhelming — particularly when the program can pay for itself in less than 6 months time! Ask your nearest AO Safety Representative for complete details.

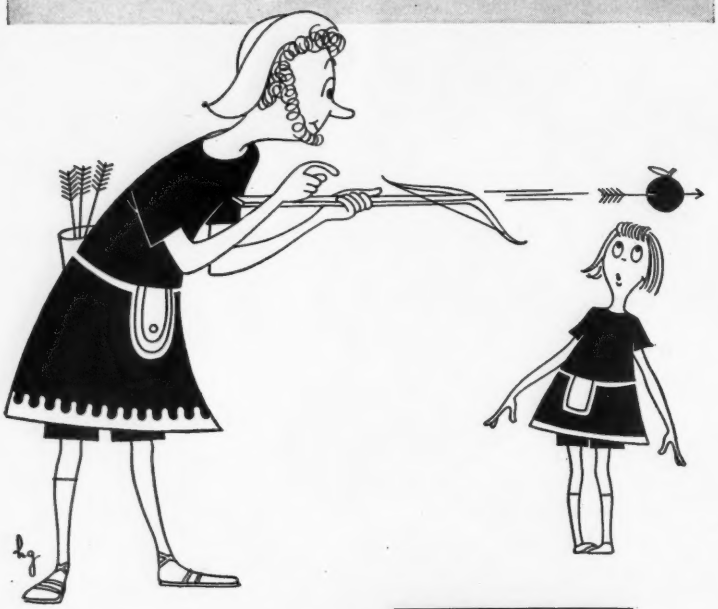


***ESTIMATE.** Does not include average cost of compensation which even for the low cost year of 1938 was $328.00.

American Optical COMPANY
SAFETY PRODUCTS DIVISION

SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES

here's ACCURACY



SIMONDS ABRASIVE CO.
grinding wheels

Whether you measure grinding accuracy by Profilometer readings or comparison with master samples of ground surfaces, it's yours with Simonds Abrasive Company wheels. Why? Because Simonds wheels are accurately specified in correct grade and grains for *your* specific operations . . . accurately tested under conditions of actual use . . . and manufactured under complete Simonds control from crude abrasive to finished wheels.

Write for free Data Book describing Simonds Abrasive grinding wheels, mounted wheels and points, segments and abrasive grains. Also request name of your nearest Simonds Abrasive distributor.

SIMONDS ABRASIVE COMPANY, PHILADELPHIA 37, PA. DISTRIBUTORS IN PRINCIPAL CITIES

Division of Simonds Saw and Steel Co., Fitchburg, Mass. Other Simonds Companies: Simonds Steel Mills, Lockport, N. Y., Simonds Canada Saw Co., Ltd., Montreal, Que. and Simonds Canada Abrasive Co., Ltd., Arvida, Que.

plan to take the issue to Washington.

Buffalo—Dealers took in stride a $9 per ton reduction in scrap prices under government economic control. But the rush of shipments against old orders at the higher prices left the market temporarily with negligible supplies and limited collection. Approximately 25,000 tons, about half the total contracted for, was shipped at the higher prices before controls went into effect Feb. 7.

Little complaining was heard over the government's action. The 83 cents switching charge fixed for this area was criticized by dealers, however. It is pointed out that the previous switching charge ran between 52 cents and 60 cents. Ceiling prices on steelmaking items are in line with expectations but some talk is heard in the trade that prices on cast grades are a bit too high compared with other items and pig iron.

Boston — Number of steel scrap orders taken at higher prices were cancelled last week, partly due to shipping difficulties. In most cases revised contracts call for delivery at rolled back price levels, which, in the case of heavy melting steel are more than $10 per ton. Buying at the new levels has perked up, both of steel and cast grades. Markdowns on cast scrap are less drastic than on steel items.

New York—Aside from the severe shortage of cars due in part to the railroad strike, scrap brokers experienced no great difficulty shifting over to the new government price schedules. There is some criticism as to certain differentials, but in the main brokers believe that a good job has been done. Under the OPS regulations the ceiling price for No. 1 heavy melting steel at all shipping points in New York city is $36.99 with stated differentials applying on all other grades.

Detroit—The ceiling prices established on scrap appear to satisfy the trade here. Next step will be an allocation system, the mechanics of which now are being set up. Possibly by Mar. 1, an allocation system will be put in force. In the meantime, some interim arrangement probably will be worked out voluntarily to take care of hardship cases where a mill cannot obtain sufficient scrap.

Without such an allocation program the price ceilings would be unenforceable, the trade feels, since specialty mills, particularly electric furnace operators, are unable to demand return of the bulk of their scrap on the same basis as the larger mills.

The new $40 delivered price for No. 1 grades in Detroit includes a 95 cent switching charge. The f.o.b. price is lower by that amount. All other grades are priced in relation to the heavy melting base in exactly the same manner as was done under OPA. Brokers' commission is added to delivered prices. Old orders are being filled at the new price levels.

Youngstown—The rollback in scrap prices is expected to put some Youngstown steel plants back into the scrap market soon. Youngstown Sheet & Tube Co. for one, hasn't been buying for weeks, using inventory instead.

Cincinnati—Dealers rushed to fill old commitments in iron and steel

"Republic Electro Paintlok puts an end to *paint peeling!*"

● "Not one single instance of paint peeling off panels in five years," reports this manufacturer after switching to Republic Electro Paintlok for Process Air-Conditioning Room panels.

Yes, Republic Electro Paintlok really takes a tight grip on paints, lacquers and synthetic enamels . . . and holds that grip through years of service. It was developed specifically for that purpose—*to offer lasting paint adherence on a zinc-coated steel surface.* As a result, this chemically-treated, zinc-coated sheet steel helps keep these panels clean and bright. Even when the paint film is accidentally scratched or broken, the zinc coating retards the spread of underfilm corrosion.

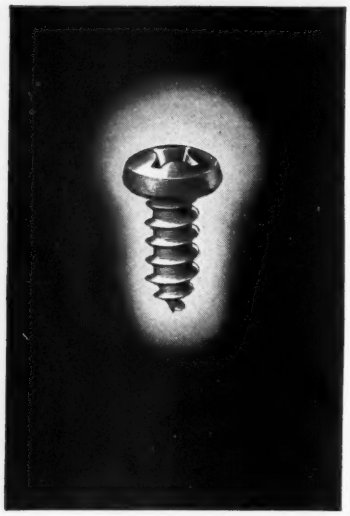
The complete story is detailed in Booklet 525. Write for your free copy today.

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Dept.: Chrysler Building, New York 17, N. Y.

"HOW ABOUT SECURITY?"
Labor has security. The farmer has security. But what about business, the third partner in today's economy? Shouldn't it have security, too? Read what Peter R. Levin has to say on this subject in "What Kind of Security for Business?" We'll send you reprints—if you'll write us.

Republic
REPUBLIC STEEL
ELECTRO ZINC PLATED SHEETS
Electro Paintlok · Electro Zincbond

Other Republic Products include Carbon, Alloy and Stainless Steels—Sheets, Strip, Plates, Bars, Pipe, Tubing, Bolts and Nuts, Wire



What Price Fasteners?

First cost or Final cost?

In terms of your over-all product cost, the price of any fastener is low. But a low *price* may be a high *cost* if a fastener keeps assembly time and reject ratios high.

A good fastener—uniform, reliable, and right for the job—can save its price many times over. Scovill makes *good* fasteners.

Scovill fasteners are made on special order only; no "bin" stock is carried. They are "custom-made" for the job.

Recessed Head Screws • Sems
Tapping Screws • Standard
Machine Screws • Special Cold Headed Parts

A PRODUCT OF SCOVILL

SCOVILL FASTENERS

Industrial Fastener Sales, Waterville Division
Scovill Manufacturing Co., Waterville 14, Conn.

Montclair, N. J. • Detroit • Wheaton, Ill.
Los Angeles • Cleveland • San Francisco

scrap before the rollback, but movement of tonnage was hampered by highway conditions and the switchmen's strike. Brokers and dealers set up a schedule of OPS quotations, and continued study of the new regulations.

Chicago—Difficulties of brokers in completing shipments to consumers in the four-day period between announcement of the new ceiling price schedule and the Feb. 7 effective date almost completely eclipsed consumer and broker reactions as to the fairness of the schedule itself.

The railroad switchmen's strike which forced embargoes on scrap shipments made it virtually impossible for any great proportion of old orders to be completed on contract terms. Requests for extension apparently fell on deaf ears. These orders now will have to be renegotiated to comply with the ceiling schedule.

The price rollbacks were not as great as had been expected in the steelmaking grades but mills appear willing to do business at once on the ceiling terms. Foundries and consumers of specialties are pleased that grades they consume are on a more realistic basis than they have been for months. Some days are expected to elapse before normal activity returns to scrap.

St. Louis—Frantic efforts by scrap dealers to get shipments to consumers before price ceilings cancelled old orders marked an otherwise quiet market here last week. Mills were equally anxious, since the rail switchmen's strike has dropped inventories to well under 30 days' supply.

There is some confusion among dealers as to the new regulations, but most of them, recalling the 50-cent commission of OPA days, are satisfied with the $1 margin.

Some St. Louis, Mo., consumers were apprehensive what the new freight differential allowed between melters in the same area would do to their competitive position in relation to consumers on the east bank of the Mississippi river, where scrap from eastern sources enjoys substantially lower freight rates.

Birmingham—Brokers and dealers are studying the 43-page price instruction booklet received from Washington. Trading is virtually at a standstill.

Seattle—Interruption of railroad service last week intensified the critical scrap situation. The largest mill here has only a 10-day inventory and production is threatened.

Warehouse . . .

Warehouse Prices, Page 123

Pittsburgh—Local distributors are entertaining an increasing number of small orders as they seek to distribute available supplies equitably among customers. Handling costs are rising which cannot be passed along to buyers in the form of higher prices under the government price freeze. Considerable shopping around for tonnage is being done, fabricators finding it impossible to satisfy their requirements at usual supply sources because of the highly unbalanced state of most warehouse stocks, both as to products and sizes. As a result, considerable production time is being lost as buyers press the hunt for particular items required to complete jobs. Instances are reported where work normally requiring about a week or so to complete has been held up as much as two months.

Boston—Less tonnage is scheduled for distributors but this partially is offset by an increasing number of DO orders covering replacements. Shortage of steel with warehouses is emphasized by heavy demand which frequently includes inquiries of mill order size. Flat-rolled, structurals and bars are notably limited in supply.

Philadelphia—District warehouses last month received from 75 to 80 per cent of the tonnage supplied by the mills in the nine-month base period of last year. However, on some specialties, especially nickel-bearing steels, the ratio is lower due to nickel conservation measures.

Cleveland—Delayed mill shipments attributable to the switchmen's strike are cutting further into warehouse inventories in this area. Distributors' outgoing movement has been only slightly interfered with since the bulk of warehouse deliveries is by truck. Pressure on the warehouses continues unabated but the unbalanced condition of stocks makes it impossible to fully satisfy customers' requirements. Much shopping around for tonnage is reported by buyers. NPA order M-6, designed to assure the warehouses a steady flow of steel from the mills, is not working out as successfully as had been hoped. Many distributors appear to lean toward a Controlled Materials Plan of distribution as the most likely way of solving their supply difficulties.

Cincinnati—Demand for steel from warehouse is apparently mounting, although this situation may be attributed partly to shopping tours. Stocks are declining, with hardly any item now in plentiful supply. Mill replacements are under expectations.

Chicago—Warehouse inventories, already low and depleted, have been further disrupted by the switchmen's strike which has cancelled or delayed shipments from mills. Such receipts as do get through are dispatched direct from cars to customers. Insufficient steel has caused many plants to reduce operations.

Birmingham—Warehouse steel supply is exceedingly short in most specifications. Worst of all, it apparently is what warehousemen and smaller buyers of steel look upon as "frozen." Demand continues exceptionally heavy.

San Francisco—Lifting of mills' set asides for DO's has not improved the distributors' position. Many warehouses request DO's from customers, but most are not insistent as these rated orders are not too widely distributed. Agricultural implements and food handling equipment, for example, lack ratings, yet represent essential customers. Meantime, warehouse inventories continue to deteriorate.

Seattle—Warehouse steel stocks are badly depleted. It is difficult for distributors to fill defense orders and practically impossible to care for shipyard, municipal and defense plant requirements. Shapes and plates are extremely scarce; sheets are practically unobtainable. Distributors are making every effort to supply requ-

How to starve wood's worst enemy

An important coke oven by-product of Kaiser Steel's Fontana plant is creosote oil—an antiseptic chemical that protects wood throughout its lifetime against the ravenous appetite of the termite.

Creosote oil is just one of a dozen by-products, produced by Kaiser Steel, which are important to a wide variety of western industries.

Another is benzol, a basic ingredient of synthetic rubber, which is in critical demand today. Others, like toluol, phenol, xylol, are essential ingredients in such diverse products as explosives, paint, dyes, fabrics, enriched gasoline . . . many of them vital to our military needs.

More evidence that the West Coast's only integrated *independent* steel plant is bringing more industry, more jobs, more wealth to the West!

It's good business to do business with

Kaiser Steel

built to serve the West

PROMPT, DEPENDABLE DELIVERY AT COMPETITIVE PRICES • plates • continuous weld pipe • electric weld pipe • hot rolled strip • hot rolled sheet • alloy bars carbon bars • structural shapes • cold rolled strip • cold rolled sheet • special bar sections • semi-finished steels • pig iron • coke oven by-products
For details and specifications, write: **KAISER STEEL CORPORATION, LOS ANGELES, OAKLAND, SEATTLE, PORTLAND, HOUSTON, TULSA, NEW YORK**

lar customers, but supplies are inadequate. Demand continues strong for all out-of-stock items.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2200 tons, Wasco county bridge, The Dalles, Oreg., to Judson Pacific Murphy Co., San Francisco; Guy F. Atkinson, Portland, Oreg., general contractor.

2000 tons, plant, Helicopter Corp., Morton, Pa., to Belmont Iron Works, Eddystone, Pa.

1400 tons, Associated Grocers warehouse, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle; Morrison-Knudsen Co., general contractor.

1400 tons, Willamette river relocation project bridge, to unstated interest; Lee Hoffman, Portland, Oreg., general contractor.

650 tons, Reading Railroad bridge over Schuylkill river, Berks county, Pennsylvania, to American Bridge Co., Pittsburgh.

525 tons, Bullard Havens technical school, Bridgeport, Conn., to Topper & Griggs (Bethlehem Fabricators Inc.) Hartford, Conn.; E. & F. Construction Co., Bridgeport, Conn., general contractor.

505 tons, high school, Valley Stream, N. Y., through Lasker-Goldman Contracting Co., to Schacht Structural Steel Inc., New York.

500 tons or more, two 100-ton gantry cranes for spillway and intake, Albeni Falls dam project, to Star Iron & Steel Co., Tacoma, low $417,930 by U. S. Engineer.

465 tons, building addition, New York Telephone Co., Mt. Vernon, N. Y., to Grand Iron Works Inc., New York.

260 tons, plant, Quaker Rubber Co., Tacony, Pa., to Belmont Iron Works, Eddystone, Pa.

240 tons, absorption towers, Delmont, Pa., to Blaw-Knox Co., Pittsburgh, through Ford, Bacon & Davis, engineers, New York.

155 tons, factory wing, Becton-Dickinson & Co., Rutherford, N. J., through Mahoney-Troast Contracting Co., to Oltmer Iron Works, Jersey City, N. J.

140 tons, Bureau of Roads bridge, Coos Bay, Oreg., to Poole, McGonigle & Dick, Portland, Oreg.; Tom Lillebo, Reedsport, Oreg., general contract.

100 tons, laundry and service building, state hospital, Middletown, Conn., to Topper & Griggs (Bethlehem Fabricators Inc.) Hartford, Conn.; H. Wales Lines Co., Meriden, Conn., general contractor; Fox Steel Co., Hartford, Conn., 80 tons, reinforcing for same project.

STRUCTURAL STEEL PENDING

8500 tons, completion locks, dam, powerhouse, McNary project, Columbia river; U. S. Engineer received bids Feb. 9.

1500 tons, improvements, Pennsylvania station, Pittsburgh; bids asked.

1290 tons, state highway bridge, route 25-A, Newark, N. J.; Ell-Dorer Contracting Co., Newark, low bidder.

830 tons, state bridge, Bronx, New York; William M. Moore Building Corp. and William Lopier Construction Corp., New York, low on construction contract.

700 tons, steel frame warehouse, McNary dam project; A. M. King, Vancouver, Wash., low $181,754, to U. S. Engineer.

300 tons, bridge, Aroostook county, Maine; bids Feb. 19.

240 tons, steel spillway bridge, Canyon Ferry dam; Virginia Bridge Co., Roanoke, Va., low, $59,878 to Bureau of Reclamation, Denver.

100 tons, also 15 tons reinforcing, Washington state highway steel girder bridge, Stevens county; bids to Olympia Feb. 20.

Unstated, proposed four-story addition to 1411 Fourth Ave. Bldg., Seattle; general bids in Feb. 8.

REINFORCING BARS . . .

REINFORCING BARS PLACED

5000 tons, second unit Seattle viaduct, to Bethlehem Pacific Coast Steel Corp., Seattle; Morrison-Knudsen Co. and Rumsey & Co., Seattle, joint contractors.

2200 tons, housing project, Louisville, Ky.; 1200 tons to Jones & Laughlin Steel Corp., Pittsburgh, and 1000 tons to Laclede Steel Co., St. Louis.

1200 tons, United States Health Center, Cincinnati, to Pollak Steel Co., Cincinnati.

950 tons, LR 765, Allegheny county, Pennsylvania, to United States Steel Supply Co., Chicago.

800 tons, warehouse building, L. S. Donaldson Co., Minneapolis, to United States Steel Supply Co., Chicago.

490 tons, power plant, Illinois Public Service Co., Hutsonville, Ill., to Bethlehem Steel Co.; LaCross Dredging Corp., Chicago, general contractor.

375 tons, Wasco county Willamette river bridge, Oregon, to unstated fabricator.

300 tons, apartment building, Peoria, Ill., to O. J. Dean Steel Co., Chicago; E. H. Marhoefer Co., Chicago, contractor.

220 tons, 4-span deck bridge, Housatonic river, Newtown-Southbury, Conn., to Bethlehem Steel Co.; also 910 tons, steel piling to same producer; Mariani Construction Co., New Haven, Conn., general contractor; McDermott Steel Co., West Haven, Conn., awarded 7860 square feet, steel grid floor.

150 tons, 3-span continuous rolled beam, bridge, Darien, Conn., to Truscon Steel Co., New York; Brunalli Construction Co., Southington, Conn., general contractor; Bethlehem Steel Co., awarded 70 tons, steel piling.

150 tons, footings for transmission towers, Navy communications center, and N. W. Life Insurance Co. office building, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle.

135 tons, addition, Woonsocket hospital, Woonsocket, R. I., to Bethlehem Steel Co.; Volpe Construction Co., Malden, Mass., general contractor.

115 tons, 3-span continuous rolled beam bridge, Darien, Conn., to Fireproof Products Co. Inc., New York; Paul Bacca & Sons Inc., Stamford, Conn., general contractor; Bethlehem Steel Co. awarded 200 tons, steel piling, also 250 tons, structural steel.

100 tons, composite steel bridge, Darien, Conn., to Truscon Steel Co., New York; Brunalli Construction Co., Southington, Conn., general contractor.

100 tons, cold storage plant, Peshastin, Wash. and miscellaneous small jobs, to Northwest Steel Rolling Mills Inc., Seattle.

Unstated, 1.77-miles, 14-foot diameter tunnel, Columbia Basin project; general contract to United Concrete Pipe Corp. and Ralph A. Bell, Baldwin Park, Cal., joint low $2,175,315.

REINFORCING BARS PENDING

29,000 tons, completion McNary dam powerhouse and other facilities; bid call out Feb. 9 by U. S. Engineer, Walla Walla, Wash.; opening date not announced.

1000 tons, Wabash Ordnance plant, Newport, Ind.; bids asked.

900 tons, Lake Shore Briar apartments, Chicago; bids in.

600 tons, caisson work, Detroit.

385 tons, main drain, project UI-261(39) Congress Street superhighway, Chicago; bids Feb. 8.

250 tons, Harbison-Walker Refractories Co., Clearfield, Pa.

200 tons, spillway dam, Albeni Falls project; bids to U. S. Engineer, Seattle, Mar. 1.

200 tons, Carney school, Ankeny, Iowa; Garmer & Stiles Construction Co., Des Moines, Iowa, contractor.

100 tons, factory building, Massey-Harris Co., Racine, Wis.; Nelson & Co., Racine, contractor.

100 tons, addition, Club Aluminum Products Co., Chicago.

100 tons, National Video Corp., Chicago.

PLATES . . .

PLATES PLACED

8320 tons, tanks, for Sinclair Refining Co., for various locations, awarded to unnamed tank makers.

2500 tons, H-piling second unit Seattle viaduct, to Bethlehem Pacific Coast Steel Corp., Seattle; Morrison-Knudsen Co. and Rumsey & Co., Seattle, general contractors.

1800 tons, 3 tanks, California Refining Co., Perth Amboy, N. J., to Bethlehem Steel Co.

675 tons, tank, Hess Inc., Perth Amboy, N. J., to Bethlehem Steel Co.

EASTON ...a dependable design and construction service in industrial cars

EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA. • NEW YORK • PHILADELPHIA • PITTSBURGH

170 tons, tank construction for Union Oil Co., Seattle, to Consolidated Western Steel Corp., Seattle.

165 tons, 3 tanks, Harbor Tank Shipping Co., West New York, N. J., to unknown fabricator.

PLATES PENDING

5000 tons, (previously reported unstated) Bow Lake water supply line; bids soon to Seattle.

PIPE . . .

CONTRACTS PLACED

375 tons, 1700 feet of 24 inch pipe, Westchester Lighting Co., Mt. Vernon, N. Y., to Republic Steel Corp., Cleveland.

200 tons, McKenzie water system project, Eugene, Oreg., to Pacific States Cast Iron Pipe Co., Provo, Utah.

STEEL PIPE PENDING

Unstated, 9640 feet, 10 gage, 6 and 4 inch; bids to Olympic View water district, Sno-

RAILS, CARS . . .

LOCOMOTIVES PLACED

Akron, Canton & Youngstown, three 1600-hp diesel-electric road switchers, to Fairbanks, Morse & Co., Chicago.

Chicago & Northern Pacific, six 4-unit 6000-hp freight diesel-electric engines and three 1500-hp diesel-electric road switchers to Electro-Motive Division, General Motors Corp., LaGrange, Ill.

New Orleans Public Belt railroad, two 800-hp diesel-electric switching locomotives, to Baldwin-Lima-Hamilton Corp., Philadelphia.

New York, New Haven & Hartford, ten 2400-hp diesel-electric motors, to Fairbanks, Morse & Co., Chicago.

Norfolk & Western, six heavy-duty freight locomotives to its Roanoke, Va., shops.

LOCOMOTIVES PENDING

Nashville, Chattanooga & St. Louis, 21 diesel electric locomotives; bids asked. List includes ten 1500-hp road switchers, six 1500-hp road units and five 1200-hp switchers.

RAILROAD CARS PLACED

Chesapeake & Ohio, 4900 freight cars, awarded as follows: 2500 seventy-ton hoppers to American Car & Foundry Co., New York; 1000 fifty-ton box cars and 200 seventy-ton covered hopper cars to Pullman-Standard Car Mfg. Co., Chicago; 750 fifty-ton box cars and 200 seventy-ton low-side drop-end gondolas, to General American Transportation Corp., E. Chicago, Ind.; 250 seventy-ton flat cars to Greenville Steel Car Co., Greenville, Pa.

Ford Motor Co., 119 seventy-ton gondolas, to Magor Car Corp., New York.

Norfolk & Southern, 150 fifty-ton gondolas, to Magor Car Corp., New York.

Norfolk & Western, 3500 freight cars with 3000 hoppers going to the company's shops at Roanoke, Va., and 500 box cars to the Birmingham, Ala., plant of Pullman-Standard Car Mfg. Co., Chicago.

FERROALLOYS

(*Continued from page* 123)

4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Low-Carbon Ferrochrome: (Cr 67-72%.) Contract, carload, lump, bulk, max. 0.03% C 33.60c per lb of contained Cr, 0.04% C 31.50c, 0.06% C 30.50c, 0.10% C 30.00c, 0.15% C 29.75c, 0.20% C 29.50c, 0.50% C 29.25c, 1% C 29.00c, 1.50% C 28.85c, 2% C 28.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. add 5c for each 0.25% of N above 0.75%.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 23.25c per lb of contained Cr, c.l., packed 24.15c, ton 25.50c, less ton 27.25c. Delivered Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract. Carload, packed, 8 MxD, 16.35c per lb of alloy; ton lot 17.2c; less ton lot, 18.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34.41%,

Design Them Around PERMACLAD Stainless Clad Steel

Today you can improve your products and equipment and give them corrosion resistance by designing them around PERMACLAD Stainless Clad Steel. PERMACLAD is stainless steel (usually 10% or 20% but can be varied to meet design requirements) inseparably welded to mild carbon steel. It has the surface characteristics of stainless steel and the easy forming qualities of mild carbon steel. With PERMACLAD it is possible to minimize use of critical materials and, at the same time, improve your product and give it corrosion resistance where corrosion resistance is needed. New applications for PERMACLAD are constantly being discovered. It will pay you to investigate and learn if your product or equipment can be improved with PERMACLAD. Write for complete information and a free copy of folder D-85.

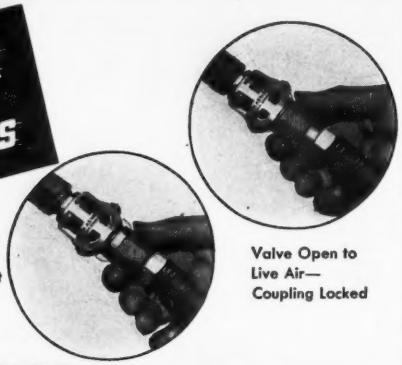
For Better Products At Low Cost . . . Specify PERMACLAD

PERMACLAD
STAINLESS CLAD STEEL
ALAN WOOD STEEL COMPANY
CONSHOHOCKEN, PA.

125 Years of Iron and Steel Making Experience

Other Products: A. W. ALGRIP Abrasive Floor Plate • A. W. SUPER-DIAMOND Floor Plate • Plates • Sheets • Strip • (Alloy and Special Grades)

Quick-As-Wink
AIR AND HYDRAULIC
Control Valves



Valve Closed to Live Air—Open to Exhaust

Valve Open to Live Air—Coupling Locked

VALVE COUPLINGS ¼", ⅜", ½", & ¾" SIZES

For Economy and Safety

● These couplings permit air to be shut off and tools changed quickly without going to the main shut-off valve. Coupling jaws are automatically self-locking when valve is open to air supply. The coupling cannot be disconnected until the valve sleeve is moved to closed and exhaust position,—thus preventing accidents and injuries. Pressures to 250 p.s.i.—hose shank, male or female pipe connections. *Send for Bulletin No. 104-C. It gives full details and prices.*

THE HIGHER THE PRESSURE THE TIGHTER THE SEAL

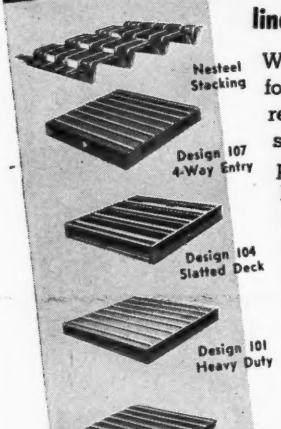
Quick-As-Wink
AIR AND HYDRAULIC
Control Valves

Hand, Foot, Cam, Pilot, Diaphragm and Solenoid Operated

Mfd. by C. B. HUNT & SON, INC., 1926 East Pershing St., Salem, Ohio

ALL STEEL
Pallet Headquarters

POWELL makes a COMPLETE line of Standard and Job Designed Pallets



Whatever your pallet needs . . . standard, four-way lift entry, slatted or solid bottom, reversible, Nesteel stacking or special designs for special jobs . . . your Powell representative is the man for you to see. If your require a special pallet ask your Powell representative about Powell **Job-Designed** materials handling equipment. Here Powell "know how" goes to work for you to design and build to the exact requirements of the job at surprisingly low cost. Whatever your pallet needs . . . Powell is the name to remember.

NOTE: Because of present conditions general order steel is in short supply. If you can furnish a D. O. Government Contract number with your order faster delivery is assured.

POWELL PRESSED STEEL SINCE 1920

POWELL PRESSED STEEL CO. • HUBBARD, OHIO
ORIGINATORS OF COLD FORMED ALL STEEL HANDLING EQUIPMENT
In Greater Youngstown Dept. 321

Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 21.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 20.65c per pound of contained chromium plus 11.50c per pound of contained silicon, f.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 36-39%, Al 7-9%, C 0.05% max.) 21.75c per lb of contained silicon plus 12.4c per lb of contained silicon plus aluminum, 3" x down, delivered.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract carload, 1" x D; packed, max 0.50% C grade, $1.08 per lb of contained chromium, ton lot $1.10, less ton $1.12. Delivered. Spot add 5c.

Tungsten Alloys

Ferrotungsten: (70-80%). Contract, 10,000 lb W or more, $3.25 per lb of contained W; 2000 lb W to 10,000 lb W, $3.25; less than 2000 lb W, $3.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $4.15 per lb of contained W; less than 1000 lb W, $4.25.

Silicon Alloys

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.00c per lb of contained Si; packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk 15.55c per lb of contained Si, carload packed 16.8c, ton lot 17.8c, less ton 18.95c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.) Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.5c per lb of contained Si, carload packed 18.7c, ton lot 19.65c, less ton 20.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.) Add 0.7c to 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l. lump, bulk, regular 20.0c per lb of Si, c.l. packed 21.2c, ton lot 22.1c, less ton 23.1c. Add 1.5c for max, 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe.) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 200 to 1999 lb 11.65c, smaller lots 12.15c.

Briquetted Alloys

Chromium Briquets: (Weighing approx. 3½ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.50c per lb of briquet, carload packed 15.2c, ton lot 16.0c, less ton 16.9c. Delivered. Add 0.25 for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.95c per lb of briquet, c.l. packaged 11.75c, ton lot 12.55c, less ton 13.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 11.15c, per lb of briquet, c.l. packed 11.95c, ton lot 12.75c, less ton 13.65c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si) Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.55c, less ton 9.45c. Delivered. Spot, add 0.25c.
(Small size—weighing approx 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

Titanium Alloys

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots 2" x D. $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Ni-

agara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract, $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

Calcium Alloys

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Delivered. Spot add 0.25c.

Vanadium Alloys

Ferrovanadium: Open-hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $3.10 per lb of contained Va. Delivered, Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3.20. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.) $3.30.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

Zirconium Alloys

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.). Contract, c.l. lump, bulk 7.0c per lb of alloy, c.l. packed 7.75c, ton lot 8.5c, less ton 9.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract carload, lump, packed 20.25c per lb of alloy ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

Boron Alloys

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Other Ferroalloys

Ferrocolumbium: (Cb 56-60%, Si 8% max., C 0.4% max.). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min., C 0.30 max.) ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta, delivered; less ton lots $3.80.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18c per lb of alloy; ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal. Fe) Lump, carload, bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c; less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24%, P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt Pleasant, or Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth, $1.32; Washington, Pa., furnace, any quantity $1.13.

Technical Molybdic-Oxide: Per lb, contained Mo., f.o.b. Langeloth $1.14, packed in bags containing 20 lb of molybdenum; Washington, Pa., 95.00c.

No. 16050 3 Inch
Hydraulic Strainer

HIGH PRESSURE HYDRAULIC STRAINER to 1500 p.s.i.

protects valves, cylinders and spray nozzles

● Electric furnace cast steel housing. The strainer consists of machined and grooved bronze rings nested around a heavy slotted multi-ported bronze back-up cylinder. The rings can be loosened and cleaned easily with compressed air, or completely removed and cleaned in solvent. Repay their cost many times over. Widely used in steel mills and forging shops to prevent partial plugging of spray nozzles, resulting in rejects due to scale streaks. 1½" to 6" sizes. Send for Data Sheet No. 3402. It gives full details.

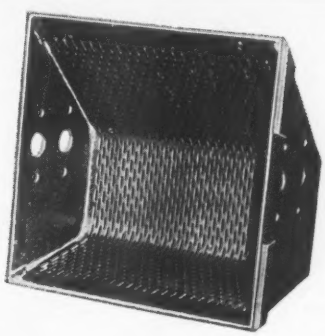
THE HIGHER THE PRESSURE THE TIGHTER THE SEAL

Quick-As-Wink
AIR AND HYDRAULIC
Control Valves

Hand, Foot, Cam, Pilot, Diaphragm and Solenoid Operated

Mfd. by C. B. HUNT & SON, INC., 1925 East Pershing St., Salem, Ohio

Typical of Hendrick's Manufacturing Facilities



Hendrick is exceptionally well equipped to manufacture to specifications a wide range of metal products that involve such operations as perforating, shaping, forming, welding, brazing, riveting, etc. The perforated elevator bucket illustrated is typical of the many specialized articles for whose fabrication Hendrick has unusual facilities. Write us in detail regarding any metal product you desire fabricated.

SEE OUR CATALOG IN SWEET'S

HENDRICK
Manufacturing Company

Perforated Metals
Perforated Metal Screens
Architectural Grilles
Mitco Open Steel Flooring,
"Shur-Site" Treads and Armorgrids

30 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities

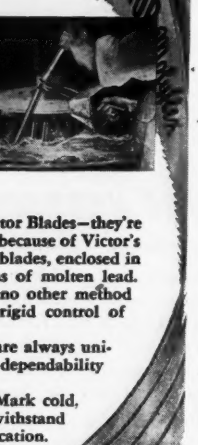
HERE'S WHY
VICTOR
BLADES
ARE ALWAYS
Uniform

they're submerged in molten lead for heat treatment

There's never the slightest variation in Victor Blades—they're *always* perfectly uniform—all ways. That's because of Victor's exclusive heat treating process. Bundles of blades, enclosed in special cylinders, are plunged into 2 tons of molten lead. Heat penetration is absolutely uniform—no other method of heat treatment provides as accurate, rigid control of temperature.

Always buy Victor. Remember, blades are always uniform...performance is always topnotch...dependability is always highest.

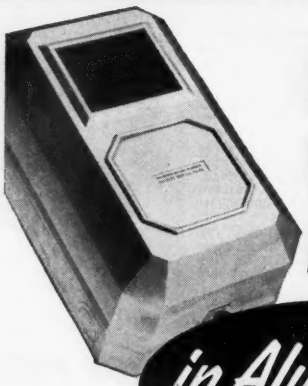
Use Steelrite Metal Marking Crayons. Mark cold, hot, damp or grimy metals, yet marks withstand pickling and do not affect enamel application. Ask your dealer for a free copy of Victor's fact-packed booklet, "Metal Cutting" for your tool box—the famous Victor Wall Chart for your shop. They'll make your metal cutting jobs easier.



7150

VICTOR SAW WORKS, INC.
MIDDLETOWN, N. Y., U. S. A.

Makers of Hand and Power Hack Saw Blades, Frames and Band Saw Blades



Die cast by Alcoa

in Aluminum

This is one of the millions of die castings delivered by Alcoa *on schedule* from its great die-casting plants. Not only on schedule, but equaling or exceeding every specification for quality and dimensional stability. Let your local Alcoa representative tell you more about Alcoa's ability to supply your die castings. He's listed under "aluminum" in your classified phone book.

Or write: ALUMINUM COMPANY OF AMERICA, 1902B Gulf Building, Pittsburgh 19, Pennsylvania.

ALCOA *Aluminum* DIE CASTINGS

ALCOA ALUMINUM

The *Cleveland Steel Tool Co.*

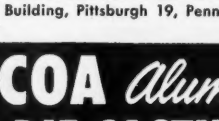
• PUNCHES • DIES • CHISELS • RIVET SETS •

IF IT'S *RIVETED* YOU KNOW IT'S SAFE

WE FEATURE SPECIAL PUNCHES & DIES

660 E. 82nd ST., CLEVELAND, O.

DIFFERENTIAL
STEEL CAR CO., FINDLAY, OHIO



Air Dump Cars, Mine Cars, Locomotives, Lorries AXLESS Trains and Complete Haulage Systems

OHIO **LOCOMOTIVE CRANES**

GASOLINE • DIESEL
ELECTRIC • STEAM

25 TO 40 TON CAPACITY

THE OHIO LOCOMOTIVE CRANE CO.
BUCYRUS, OHIO

WISE ECONOMY Results from
WISE SELECTION of cutting fluids

D.A. Stuart Oil CO. LIMITED
EST. 1865

2735-37 SOUTH TROY ST., CHICAGO, 23.

IF METALWORKING PLANTS ARE YOUR PROSPECTS . . .

STEEL can put you in touch with the important ones, those that do more than 92% of the industry's business. Tell the buyers and specifiers in these plants of the machines or materials you have for sale through an "Equipment—Materials" advertisement. For rates write STEEL, Penton Building, Cleveland 13, Ohio.

Metalworking Briefs . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

California

Latrobe Electric Steel Co., Latrobe, Pa., moved its Los Angeles office to 3537 E. Olympic Blvd., that city. C. W. Barnthouse, district manager, is in charge of the enlarged office and warehouse staff. He is assisted by Carl W. Barnthouse Jr., sales and service representative, who formerly was located at the plant in Latrobe.

California

Bellows Co., Akron, O., manufacturer of industrial pneumatic devices, established West Coast regional headquarters at 733 E. Pico Blvd., Los Angeles. George Cook is the West Coast regional manager. The company also is taking over all distribution sales activities for Smith-Johnson Corp., Los Angeles, manufacturer of Senacon pneumatic equipment.

California

Johnson Corp., Three Rivers, Mich., appointed Guy L. Warden & Sons as its representative in all of California and part of Oregon. Formerly this agency was representative for Johnson in lower California. Johnson Corp. manufactures steam specialties and boiler room equipment.

Delaware

Atlantic-Eastern Steel Corp. filed a charter of incorporation with the secretary of state's office, Dover, Del. Capital of the firm is listed at $2.5 million. Corporation Guarantee & Trust Co., Wilmington, Del., is serving as the principal office.

Delaware

Kirchoefer Farm Supply Inc. — farm machinery — was chartered by the secretary of state's office, Dover, Del. Capital of the firm is listed at $50,000. U. S. Corporation Co., Dover, is serving as the principal office.

Delaware

Lee Corp.—machinery—was chartered by the secretary of state's office, Dover, Del. Arthur B. Carr, Wilmington, Del., is serving as the resident agent.

Delaware

Metron Inc.—steel products—was chartered by the secretary of state's office, Dover, Del. Metron Steel Corp.—steel products—also has been chartered. Corporation Service Co., Delaware Trust Bldg., Wilmington, Del., is serving as the principal office.

Illinois

Caterpillar Tractor Co., Peoria, Ill., established an additional administrative sales division. The new Plains Division is made up of territory formerly under the Central Division which will take over part of the Eastern Division. Engines sales department is operating as the Industrial Division of the general sales department. The Sales Training Division suspended organized sales training classes.

Iowa

Dexter Co., Fairfield, Iowa, manufacturer of clothes washing machinery and castings, awarded a contract to W. A. Mattson, Burlington, Iowa, for an addition to its plant. Estimated cost is $150,000.

Kentucky

Electric Energy Inc. increased the projected size of the power plant it plans to build at Paducah, Ky., to supply the government's planned atomic energy plant. Estimated cost ranges up to $88 million instead of a previous estimate of $73 million. The power company was formed by Union Electric Co. of Missouri, Middle South Utilities Inc., Central Illinois Public Service Co., Illinois Power Co. and Kentucky Utilities Co.

New Jersey

S. G. Frantz Co. Inc. transferred its sales and manufacturing facilities from New York to a recently built plant on the outskirts of Trenton, N. J. The company makes magnetic separators and filters.

New Jersey

Joseph T. Ryerson & Son Inc., Chicago, is appointed exclusive warehouse distributor of Rockrite tubing manufactured by **Tube Reducing Corp.,** Wallington, N. J.

New York

Carborundum Co., Niagara Falls, N. Y., established a marketing department under the direction of Frederick T. Keeler. The department brings together all related staff functions of marketing, including market research, advertising, sales promotion, and public relations. Mr. Keeler is director of marketing; Arthur Batts Jr., mana-

Cut *Circular Sawing* Costs-- with MACCO 472

The Cutting Lubricant that reduces costs & increases profits!

INCREASES SAW LIFE AND OUTPUT

Here are seven reasons why Macco 472 is used for circular sawing in plants all over the United States--

1--Increases saw life--up to 250%

2--Stops chips from welding to tips of saw teeth

3--Prevents build-up on sides of saw teeth

4--Won't turn rancid--eliminates need for frequent cleaning

5--Carries heat--sawed pieces can be handled immediately

6--Cuts costs--carry off 50% under sulphurized oil

7--Economical--mixes 5 to 1 with any ordinary water

Fully automatic circular saw cutting 1¼" 1040 steel. Macco 472 replaced mineral oil base soluble. Increased blade life—150%!

Send for this new illustrated folder — filled with facts about Macco 472.

Try MACCO 472 IN YOUR PLANT!

Regardless of the machines you have...the cutting tools you use... or...the metals you process—it will pay you to use Macco 472. Test it in your plant...you'll be glad you did.

MACCO PRODUCTS COMPANY

525 WEST 74TH STREET · CHICAGO, 20, ILLINOIS

REED ENGINEERING COMPANY

MODERN METALWORKING MACHINES

1005 W. Fairview
Carthage, Mo.

OFFSET FORMING MACHINES

IN TWO MODELS
M-2—1/16 to 3/16 in. plate
M-4—3/16 to 7/16 in. plate
WRITE FOR BULLETIN 73A

M-4 OFFSET FORMER

● Improves automatic welding production by eliminating chill-rings & backing bars ● Forms offset weld-backing joggle from tank shell ● Loosens rust & mill-scale ● Improves shell roundness, which reduces fit-up time.

BENDING ROLLS * TURNING ROLLS * SPECIAL MACHINES & FIXTURES

* WELDING FIXTURES * OFFSET & CONTOUR FORMERS *

STAINLESS STEEL

—PERFORATED—
TO YOUR REQUIREMENTS
SEND US YOUR DWGS FOR PRICE

ALL SIZE AND SHAPE HOLES ALL METALS
ARCHITECTURAL GRILLES

SEND FOR CATALOG NO. 35

DIAMOND MFG. CO.
BOX 32 WYOMING, PA.

THE BELMONT IRON WORKS

STRUCTURAL STEEL—BUILDINGS & BRIDGES

RIVETED—ARC WELDED *Cable Address—Beliron*
Engineers—Fabricators—Erectors—Contractors—Exporters
Shops—Philadelphia—Eddystone—Royersford
Main Office: Phila. 46, Pa.
New York Office—44 Whitehall St., N. Y. 4, N. Y.

● PICKLING TANKS ●
● PLATING TANKS ●
● ANODIZE TANKS ●
HEATING UNITS FOR ACID TANKS
HEIL PROCESS EQUIPMENT CO.
12901 ELMWOOD AVE. CLEVELAND, OHIO

THE ULTIMATE IN PRECISION CASTINGS

Intricate precision castings made from frozen mercury patterns assure you of soundness — accuracy — close tolerances — 60-80 micro finish and minimum machining in size ranges not available by conventional casting methods. All ferrous and non-ferrous metals. Inquiries invited. Brochure on request.

MERCAST PROCESS
ALLOY PRECISION CASTINGS COMPANY
EAST 45th ST. AND HAMILTON AVE. • CLEVELAND 14, OHIO

Steel Makers Since 1871

STRIP STEEL

STANLEY
Reg. U. S. Pat. Off.

Hot Rolled – Cold Rolled Special Carbon – Alloys

The STANLEY WORKS
New Britain, Bridgeport, Conn.—Hamilton, Ont.

FERRACUTE PRESSES
Complete line. Mechanical power presses 32 to 500 tons. Since **1863.**
FERRACUTE MACHINE CO., *Bridgeton, N. J.*

Certified Steel Abrasives
FOR USE IN BLAST CLEANING EQUIPMENT
SAMSON STEEL SHOT
ANGULAR STEEL GRIT
PITTSBURGH CRUSHED STEEL CO., PITTSBURGH, PA.
STEEL SHOT & GRIT CO., BOSTON, MASS.
Reg. U. S. Pat. Off.

MASTER MAKERS OF FINE BEARING METALS SINCE 1860

A. W. Cadman Mfg. Co.

28th and SMALLMAN STS., PITTSBURGH 22, PA.

INTRODUCTION TO THE STUDY OF HEAT TREATMENT OF METALLURGICAL PRODUCTS

By Albert Portevin

Fundamental knowledge and essential principles of heat treatment of steel are presented in simple and understandable manner. Research engineers, metallurgical students and steel plant metallurgists engaged in metallurgical investigations and the heat treatment of ferrous and non-ferrous metals will find this book of inestimable value.

246 pages **4 tables**
69 illustrations **Price $5.00 Postpaid**

THE PENTON PUBLISHING CO.
Book Department, 1213 W. 3rd St., Cleveland 13, O.

ger of commercial research; Arthur W. Cowles, advertising manager; Lewis P. Mercer, manager of sales promotion; E. Dent Lackey, public relations manager.

New York

All United States and Canadian patents, rights, inventories and agreements pertaining to continuous casting of metals, including the Junghans and Dunross patents and the Rossi Continuous Casting Co., formerly owned by Irving Rossi, are now the exclusive property of **Continuous Metalcast Corp.**, 17 John St., New York.

Ohio

Duriron Co. Inc., Dayton, O., plans to erect a $400,000 office building. The company specializes in acid resisting alloys and chemical plant equipment.

Ohio

Cincinnati Milling Machine Co., Cincinnati, plans to build additions to its foundry and No. 2 machine shop. Estimated cost is $440,000.

Ohio

Arms Industries Co., Youngstown, purchased a plant at Columbiana, O., and will start production of defense items in the near future.

Pennsylvania

Willard Storage Battery Co., Cleveland, will build a plant in Allentown, Pa., that will cost an estimated $2 million, including equipment.

Pennsylvania

Plibrico Jointless Firebrick Co., Chicago, appointed Stanley F. Heller & Son, Stroudsburg, Pa., as its distributor in northeastern Pennsylvania.

Texas

Cleco Division, Reed Roller Bit Co., Houston, appointed Montes y Valles, S.A., Vallarta 1, 305B, Mexico 4, D. F., as distributor of Cleco products in that area. The Cleco line includes pneumatic tools for construction, manufacturing, metal fabrication, foundries, industrial maintenance and stone carving.

Wisconsin

Name of Gibbs Division, **George W. Borg Corp.**, was changed to Borg Equipment Division of the corporation, Delavan, Wis.

Canada

Norton Co., Worcester, Mass., is operating a new electric furnace plant at Cap-de-la-Madeleine, Que. The plant, purchased in 1949 from Durham Chemicals Ltd., provides expanded facilities for a 50 per cent increase in the manufacture of silicon carbide.

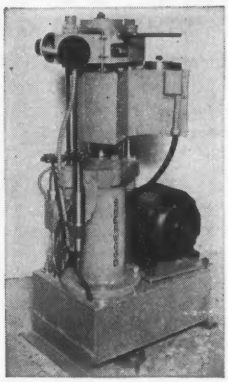
EASIER THAN THREADING A NEEDLE: Conveying wooden shipping spools to the balcony area at Westinghouse's copper wire mill at Buffalo, N. Y., is made easy by roller conveyors. Returned spools are unloaded from trailer trucks onto the roller conveyor where gravity carries them to the power-driven belt conveyor used to transport them to the balcony. In the area shown spools are sorted, repaired and stored until needed

INCREASE WAX PATTERN PRODUCTION FOR PRECISION INVESTMENT CASTING

Sherwood

MODEL WP-12

WAX INJECTION PRESS



- Produces wax or plastic patterns for precision investment casting in large volume.
- Temperature range to 400° F.
- Pressure range to 1500 p.s.i.
- Large capacity—4 cylinders each containing 67 cubic inches.

Send for descriptive circular and informative booklet "Modern Precision Investment Casting!"

ALEXANDER SAUNDERS & CO.

Precision Investment Casting Equipment and Supplies

95 Bedford St. WAtkins 4-8880 New York, N. Y.

HOT DIP GALVANIZING

JOS. P. CATTIE & BROS., INC.

Gaul & Letterly Sts., Philadelphia 25, Pa.

GALVANIZED PRODUCTS FURNISHED RE 9-8911 PICKLING & OILING

NEED WASHERS?
Call on WHITEHEAD!
In Whitehead's large assortment of washer dies, you may find the particular die you require. Send your blueprint for an estimate.
WHITEHEAD STAMPING CO.
WHITEHEAD EST. 1903
1667 W. LAFAYETTE BLVD., DETROIT 16, MICH.

EQUIPMENT--MATERIALS

RAILROAD EQUIPMENT—*FOR SALE*

STANDARD GAUGE FREIGHT CARS

Box, Single Sheathed, 40 & 50-Ton
Flats, 50-Ton and 70-Ton
Gondolas, Composite, 50-Ton and 70-Ton
Gondolas, Composite, 50-Ton, Low Side, Drop End
Hoppers, Covered, All-Steel, 50-Ton & 70-Ton
Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Hoppers, Triple, All-Steel, 70-Ton, Cross Dump
Ore Hopper, All-Steel, 50-Ton, Center Dump
Tank, 8,000-Gallon, Class II
Tank, 10,000-Gallon, Class III

STANDARD GAUGE DUMP CARS

End Dump, 20-Yd., 50-Ton, Drop Door
End Dump, 10-Yd., 30-Ton, Lift Door
Side Dump, 16-Yd., 40-Ton, Lift Door
Side Dump, 20-Yd., 40-Ton, Lift Door
Side Dump, 30-Yd., 50-Ton, Lift Door

STANDARD GAUGE LOCOMOTIVES

One 50-Ton H. K. Porter, Type 0-4-0, Oil-Fired, Steam, Built 1942
Gasoline—10-Ton to 25-Ton
Diesel-Mechanical—8-Ton to 30-Ton
33-Ton Gasoline
Gasoline-Electric—35-Ton
Propane-Electric—70-Ton

General Electric Diesel-Electric

44-Ton, 380 H.P., 4 Traction Motors
45-Ton, 300 H.P., 2 Traction Motors

Send us your inquiries **We Buy Freight Cars for Dismantling** ***Send us your offerings***

IRON & STEEL PRODUCTS, INC.

REPAIR PARTS For All Types of Freight Cars

General Office
13462 S. Brainard Ave.
Chicago 33, Illinois
Phone: BAyport 1-3456

New York Office
50-D Church Street
New York 7, N. Y.
Phone: BEekman 3-8230

STORAGE TANKS
6,000 Gallon
8,000 Gallon
10,000 Gallon

"ANYTHING Containing IRON or STEEL"

OFFERING
SODIUM CYANIDE
POTASSIUM CYANIDE
TRICHLORETHYLENE
Imported Material for Spot and Future Delivery
ACETO CHEMICAL CO., INC.
82 Beaver St., New York 5, N. Y.
Digby 4-9760

WANTED BY USER
8' to 10' BRAKE PRESS
75 to 100 ton capacity. Also
10' POWER SHEAR
Both must be in good condition. State price and location or inspection of equipment in first letter.
KUEHNE MANUFACTURING CO.
Mattoon, Illinois

MATHEWS
CONVEYERS
Since 1905. Engineers and manufacturers of Conveyers and Conveyer Systems for the Metal-working Industries.
Three modern plants. Engineering Offices in All Principal Cities. There's an Engineering Sales Office near you.
MATHEWS CONVEYER CO.
ELLWOOD CITY · PENNSYLVANIA
SAN CARLOS · · CALIFORNIA
PORT HOPE · ONTARIO, CANADA

ROLLING MILLS and EQUIPMENT
FRANK B. FOSTER, INC.
2217 OLIVER BLDG. PITTSBURGH 22, PA.
Cable Address: FOSTER, Pittsburgh

WANTED
NICHOLS Hand Millers; B&S Screw Machines; W&S Turr. Lathes; CYL. GRINDERS; DUPLEX Millers; ALLEN Drill Presses Mod. 2KH; SUNDSTRAND "00" Rigid Mills; 2⅝", 3½". CONE, ACME, GRINDLEY 6 & 8 Spindle Screw Machines COLD DRAWN SCREW STOCK
Reply Box 239,
STEEL, Penton Bldg., Cleveland 13, O.

BORING MILLS, 24"-36"-42"-52"-66"-72".
GRINDER, Centerless No. 3 Cincinnati.
HAMMER, Nazel, 5-N, 6" x 6", M.D.
KEYSEATERS, Nos. 1, 2 and 5 Baker.
MILLER, Plain No. 3-B and 5-B.
MILLER, Vertical No. 2 K & T, M.D.
SHAPER, 36" Morton Draw Cut.
WEST PENN MACHINERY COMPANY
1210 House Bldg. Pittsburgh 22, Pa.

FOR SALE
1—#2 BAKEWELL TAPPER 1944
1—HENDEY 20" SHAPER Rpd. Trav.
1—NICHOLS Hand Miller
1—6 x 18" NORTON Cyl. Grinder 1941
2—HALL PLANETARY THREAD MILLERS
SEABOARD STEEL CO., INC.
New Haven, Conn.

WANTED
A DECOILER TO HANDLE UP TO 48" & 15,000# COILS.
Can be cradle or coil box.
Call, Wire, Write
STEEL WAREHOUSE CO., INC.
P. O. Box 115 South Bend, Ind.
Phone: 3-7157 Attn: N. Lerman

MAKE IT A HABIT . . .
To read the classified pages of STEEL each week. You will find listed there surplus materials and used equipment for sale which may fill your requirements to a tee and save you much time and effort locating them.

STEEL CAN HELP YOU BUY OR SELL

Used or Surplus Machinery and Equipment. Send in your copy instructions for an advertisement in this column. Your ad will reach the important menin the metalworking and metal-producing industry. Write to STEEL, Penton Bldg., Cleveland.